



# RESEARCH



Quarterly Newsletter  
October/November 2013

Office of the Vice President for Research

## Strengthening the foundations of research at KU

### October/November 2013 Highlights

*Events, Activities, Happenings...*

#### *Inside...*

- RS Remodels Strategy --  
VPR's Message.....2
- KU-KISR Agreement.....2
- RS releases e-manual 2013.....4
- RS-AMandumah Agreement.....5
- RIG session 2013 .....6
- RS starts KURP'S  
implementation.....8
- Shagaya renewable energy.....10
- Distinguished Research  
Series - 5.....14
- OVPR's Latest Publications.....18
- Postdoctoral Research at Tai  
National Park.....22
- RS Felicitates Distinguished  
Researchers .....24
- English Language Editing  
Service.....28
- Statistics on Faculty Research  
(Sept. 2012 to August 2013).....32
- OVPR Introduces  
Instagram.....34
- Risk of extreme sea level.....37
- SPSS Workshop.....39



**KU - KISR  
Agreement**  
Page...2

**RS - AMandumah  
Agreement**  
Page...5



**RIG  
Session, 2013**  
Page...6



[www.ovpr.kuniv.edu](http://www.ovpr.kuniv.edu)

K u w a i t U n i v e r s i t y

RS remodels its strategy for advancing faculty research in line with KU's latest vision and mission statement

Key goals and priorities set for globalizing research through developing institutional internal strengths and external profile

RS adheres to universally applicable standards in pursuing the policy of high quality research

With the onset of scholastic year 2013/14, the Research Sector is all set to remodel its strategy for advancing faculty research within the framework of Kuwait University's latest mission statement that accords parallel significance to academic process and scientific research, the two pillars for meeting national developmental goals and realities of modern times, through a system of higher education and scientific research that is focused on quality and excellence, promotes community service and responds to the needs of society. For the first time, research has been recognized for its equally important role alongside academics, in institutional developmental process, generating and transmitting knowledge, nurturing and shaping students scientific and professional aspirations and careers, in a climate of innovation, creativity, and discovery. For

the Research Sector, it gives a whole new outlook and perspective in strengthening institutional scientific foundations, with a sense of greater responsibility and commitment, requiring focus on issues and priorities that could enable us to benefit from our research strengths, and be conducive to elevating the status of research at KU towards global dimensions. RS is driven towards accomplishing this mission by focusing its priorities on four key goals:



Prof. Hasan Al-Sanad  
Vice President for Research

### Key goals

- **Enhancing Scientific Research at KU** -- through priorities, performance, productivity, quality, and research outputs.
- **Investing research outputs** -- through applied and value-added research, channelizing KU expertise in addressing national, economic, social and industrial concerns, and offering practical solutions.
- **Globalizing KU research** -- through high quality publications, patents, conferences, and uplifting KU's status in international scientific rankings.
- **Developing scientific research culture** -- through collaboration and partnerships with local and external institutions, industrial, economic and social sectors, promoting awareness through scientific sessions, conferences, and seminars. (Contd. on ... P.3)

"Research collaboration vital for developing KU Graduates caliber" – KU President

### KU-KISR enter into formalized agreement for research collaboration and scientific exchange

In a strategic move to explore, share and develop indigenous scientific potential and capabilities for advanced and innovative research, Kuwait University (KU) entered into formalized agreement for research collaboration with Kuwait Institute for Scientific Research (KISR), starting a new phase in inter-institutional alliances for addressing priorities and advancing knowledge. The ceremonial event was held under the distinguished

presence of Kuwait University President, Prof. Abdullatif Al-Bader, amid the attendance of Prof. Hasan Al-Sanad, Vice President for Research, and his assistants, Prof. Obaid Al-Otaibi, Prof. Haitham Lababidi and Prof. Nejib Al-Smaoui, at the University Council Hall, on Oct. 23, 2013, at 9.30 AM. The elite delegation from KISR included Dr. Naji Al-Mutairi, Director



▲ Participants at the KU-KISR Signing Ceremony

General, and his assistants, Dr. Husam Al-Ameera, (Contd. on ... P.3)

## ► *RS remodels strategy— VPR's Message...(From.... P2)*

These goals outline RS strategy for realizing the institutional vision of a global platform for Kuwait University, recognized for its scientific achievements, and for acquiring a befitting ranking among elite universities on the quality of its research, and credibility of its academic programs, with RS set to develop its *internal strengths*, and *external profile*. Our intent and focus would be on *high quality, high performing* research that holds *impact*, and registers international *presence* on grounds of research quality, through universally applicable standards while pursuing the *policy of high quality research*, and for monitoring faculties published research as per the JCR index.

Our focus would also be on creating a climate for *engaging faculties* in high quality distinguished research, effective in registering KU's presence among prestigious world rankings, as well as elevating its international status and standing. A *three-fold action plan* has been devised for this purpose that would ensure *continuous support to faculties* for original, high quality *basic, applied, and humanities* research, *enhance collaborative research* through partnerships, and *promote research culture that encourages creativity* and yields outputs of scientific, social and economic value.

With the *priorities* identified, faculties have a choice to explore any of the 15 priority areas that are nationally relevant, and require original, collaborative and multidisciplinary research for redressal of key concerns, in search of practical solutions, and for discovering new *knowledge and technology*. Faculties are also being encouraged to develop new ideas, and utilize their expertise and potential in pursuing complex and interdisciplinary studies, while effectively harnessing graduates talent in

pursuing breakthrough research. RS committed steps in this direction include the facility of *Research Chair*, for appointing international experts that could enhance faculties research strengths, and doors have been opened for appointing graduate students as *postdoctoral fellows* on approved projects, as co-investigators. Already 10 applications are under process in these domains, with 2 Research Chair, and 8 postdoctoral fellowships. Presently, Shell Professorial Chair in *natural gas* has been announced, and a seasoned applicant in Dentistry is pending clearance, while three postdoctoral candidacies are approved, and *fourth* is in the pipeline.

In the sphere of funded research, the faculty research activity achieved significant expansion, with *606 projects* registering a clear 6.3% growth in KU research, during the academic year 2012/13. These included *393(64.9%) ongoing* projects, *125(20.6%) completed*, and *88 (14.5%) under-process*. Of the total grants, the volume of big-budgeted projects increased significantly, with *43.9% (266) projects* accounting for KD 10,000+ grants, and *40.3%(244) projects* having medium range budget (KD 4001-10,000/). Together, these two budgetary categories were responsible for a massive 84.2% (510) projects of all awards granted during 2012/13, with low budgeted projects having declined to 15.8% (96) of grants under less than KD 4001/-. This development is promising, exhibiting faculties growing involvement in well-designed, multidisciplinary studies that often require substantial resource support for achieving comprehensive objectives, with possibility of breakthrough findings. During 2012/13, all colleges actively participated in RS funded research, with the welcome

(Contd. on ... P.13)

## ► *KU-KISR Agreement...(From.... P2)*

**KU-KISR ceremonial signing opens the door for sharing potentials and expertise across two institutions for addressing priorities and advancing knowledge**

Dr. Wajeeh Sawaya, Dr. Salem Al-Hajraf, Dr. Faihan Al-Otaibi, Majid Al-Shimmari, Eng. Mohamed Al-Humoud, Eng. Nasser Al-Awadi, and Yousef Abdal. The agreement, signed by Prof. Al-Bader and Dr. Al-Mutairi, reaffirmed the understanding between the two institutions as regards the significance of research in advancing knowledge and its potential applications in addressing and

resolving issues of strategic relevance to Kuwait, the Arab and Gulf regions.

Speaking on the occasion, Prof. Al-Bader considered research a vital precursor of advancement, and for developing the potential and caliber of graduate and postdoctoral students, who could actively be involved in meaningful research under the guidance and supervision of established



► **KU-KISR signing the agreement experts and scientists. Benefitting**  
(Contd. on ... P.7)

**e-manual released on RS website for instant access to latest regulations governing KU's grant awards**

**Research Sector releases *third edition* of the manual of *Research Support Rules & Regulations, 2013*, with expanded *scope*, additional *clauses* and new *bye-laws***

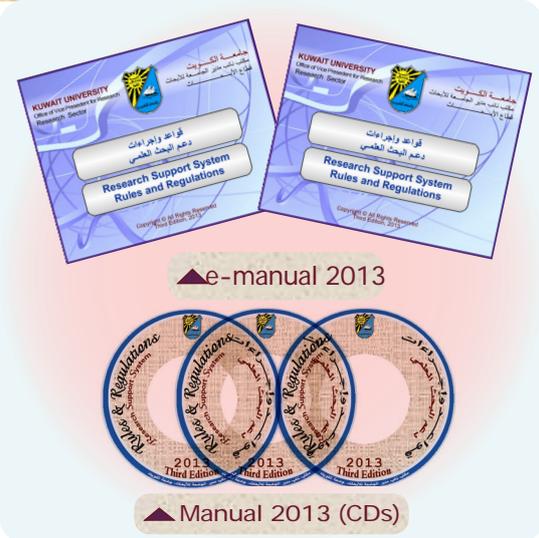
The Research Sector's consistent efforts towards extensive updating and reformation of the manual of *Research Support Rules & Regulations, 2013*, matured into a comprehensive *third edition*, providing first-hand information on Kuwait University's grant support system, in line with the changing scientific climate and institutional developmental needs. Prepared in a bilingual Arabic/English format, with an expanded scope and substance, the latest manual provides an exhaustive overview of the fundamentals of research support system, specifying *key rules and regulations* governing the allocation of grants, awarded under distinct types of research support categories. To facilitate researchers reference needs, both *print and electronic* versions of the manual have been generated, adding a significant new dimension in faculty research, with the inclusion of *new chapters, clauses* and *bye-laws*, governing the entire ramifications of the principle of grant awards at Kuwait University, while offering researchers a *simplified and flexible procedural* framework, including *opportunities for incentives and awards*. The e-manual has already been released, and accessible on RS website ([http://www.ovpr.kuniv.edu/rr/RSYRL\\_EN.htm](http://www.ovpr.kuniv.edu/rr/RSYRL_EN.htm)), providing an interactive electronic interface to the faculty research community, for online access to the legislative and descriptive guidelines, explicitly defining each aspect of the research support mechanism, inclusive of new refinements, additions and updates.

In all, *15 chapters and 77 articles*

Grounded in RS *principles, policy* and *objectives*, the manual offers far wider choices and benefits to faculties for advanced and innovative research, setting a new *benchmark* for high quality research

condense the entire universe of the grants support system at KU, with several significant new inclusions. These include a new chapter on *Research Chair and Postdoctoral Fellowship* (Chapter 9, articles 32 – 43), outlining two purely *research centered* positions, with new legislative clauses, conditions and requirements. Another chapter on *Research Units or Laboratories* (Chapter 15, articles 71-77) has also been added, offering faculties the provision of developing their indigenous infrastructural capacity and capabilities for advanced and innovative research. In the sphere of service-related matters, new clauses have been added for faculties to have the advantage of *consultative and statistical services* (article 16) for their project-related needs, and privilege of small project-related purchases (*article 17*) granted through *research facilities reward*, with allocated amount tied to a project's duration. Doors have also been opened for the hiring of Kuwaitis as "*Researchers' and 'Senior Researchers'*" (article 25) on research projects, while *Research Project Incentive Rewards* (article 70) offers an additional financial rewards stimulus to KU researchers on successful completion of *funded research projects*.

The fundamental basis of the manual remains grounded in RS *principles, policy* and *objectives*, offering far wider choices and benefits to faculties



for advanced and innovative research, developing their research strengths, and creating an enhanced culture and climate for creative excellence, driven towards high quality research of international credibility. The manual sets standards, and *defines criteria, conditions* and *requirements* of grant support, creating a receptive and flexible system of governance in rendering grant support. The financial elements have also been redefined, with new *funding-levels* offering raised budgetary allocations for *small, medium* and *large-scale* projects, while new fiscal parameters have been set for mission *participation*, based on country-wise groupings, and purchase procedures, manpower hiring, petty cash settlement have been simplified. The core objective, however, is to strengthen institutional scientific foundations, develop faculties creative potential, and encourage innovative research through well defined, original

**(Contd. on ... P.29)**

## RS signs *scientific collaboration* agreement with Saudi based Dar AlMandumah Institution

Agreement opens the door for enlisting APC's journals in AlMandumah database for wide exposure of Arabic scientific research

In a bid to ensure wide exposure to Arabic research, published in Kuwait University's Academic Publication Council (APC) journals, and in widening institutional collaborative horizons, the Research Sector (RS) signed an agreement with the Saudi based Dar AlMandumah Institution, laying the basis for scientific collaboration. The agreement was signed by Prof. Hasan Al-Sanad, Vice President for Research, and Dr. Ali Alshowaish, General Manager, Dar AlMandumah Institution, at the Meeting Room, Office of the Vice President for Research, on Oct. 24, 2013, at 9.30 am., opening the door for inclusion of scientific studies published in APC journals in the AlMandumah database, a vast integrated reference resource, networking scientific research journals in the Arab World.

The database provides an electronic interface for accessing Arabic scientific research and studies, for the benefit of professionals, researchers, and experts, facilitating direct access to a vast pool of scientific information based on existing Arabic journals and data records in the Arab region. Speaking on the occasion, Prof. Hasan, expressed the significance of an enduring platform that could display, disseminate and allow access to a wealth of Arabic scientific research and information generated in the Arab world, that need organized exposure and indexing for the benefit of the scientific community, with RS-AlMandumah collaboration

marking a significant step in that direction.

Appreciating the ongoing efforts that eventually evolved and culminated into formalized agreement between the two sides, Prof. Hasan looked forward to the critical data-linkage that would ensure wide dispersal



▲ Prof. Hassan and Dr. Alshowaish at the ceremonial signing event



▲ RS-AlMandumah agreement being formalized

of APC's Arabic scientific journals and Arabic published articles through AlMandumah's database. He also shared his concerns and views on the quality of Arabic research, the absence of reliable standard for assessing the quality and impact factor for Arabic publications, and the quality of Arabic scientific journals, especially unrefereed publications.

Acknowledging the lack of universally applicable fundamentals in ascertaining the quality of Arabic scientific journals, Dr. Alshowaish exhibited keen interest in sharing ideas towards a unified standard for ascertaining Arabic research quality, saying that

AlMandumah itself was working towards achieving that objective. Exhibiting immense satisfaction at the collaborative agreement with KU, he hoped the scientific community would draw benefit from the database contents, which provides document-search by *key descriptors, subjects, research titles, authors, journals* and *articles*, serving widely divergent needs of academicians, researchers and students, as well as institutions, interested in scientific research in Arabic.

Elaborating further, he said that AlMandumah provides Arabic research access in the areas of economics and education, listing Arabic articles, periodicals and conference papers from around the Arab world since 1994, while ensuring AlMandumah's commitment to make available the database-listed articles to serve KU, as well as all Arab researchers, publishers

(Contd. on ... P.7)

RIG session orients new Kuwaiti faculty members to the prevailing scientific environment at KU, enlisting their active participation

**RS organizes special session on Research Initiation Grants, introducing key aspects of grant support system, and opportunities for initiating research activity, through the award of grants**

**Hosted by RS on Oct. 28, 2013, RIG session attracts participation of 61 new Kuwaiti faculty members at Assistant Professor's level**

Carrying forward its annual mission of introducing new Kuwaiti faculty members to the domain of scientific research at Kuwait University, the Research Sector organized a special session on Research Initiation Grants (RIG) under the presence of Prof. Hasan Al-Sanad, Vice President for Research, and his Assts., Prof. Haitham Lababidi, Prof. Nejb Smaoui and Prof. Obaid Al-Otaibi, on Oct. 28, 2013, at 12.30 PM., at the University Conference Hall, Administration Building, Khaldiya. Welcoming the new Kuwaiti faculty members, Prof. Hasan briefly outlined the role of research in scientific advancement and institutional development, and given this significance, Kuwait University has a well-established system of scientific research, providing opportunities for pursuing research through RS Research Support System. This session is aimed at sensitizing new faculty members to the prevailing scientific environment at KU, introducing key elements of grant support system, and utilizing RIG grants as a starting incentive for initiating research activity, prior to moving towards larger, well-defined, comprehensive studies.

Continuing further, Prof. Hasan looked forward to energetic participation of the young faculty in pursuing scientific research, considering it as an enduring platform and mission towards *probing, discovering, and advancing*

*knowledge* through their *talent, skills and ideas*. On its part, RS would extend the needed resources and facilities to enable the young researchers in implementing and accomplishing their research goals. He then introduced the RS executive cadres, responsible for various aspects of the grant support procedures, specifics of which were outlined by the



▲ RIG session in progress...!

Online presentations outline institutional research policy, programs and procedures for initiating research

concerned Assts. Vice President for Research.

Presenting the latest outlook of the research support activity at KU, Prof. Nejb specified types of research categories, under which grants are offered, the funding levels for small, medium and large-scale projects, and the refereeing process that ensures the quality and significance of proposed research. He also explained online submission of projects, and processing workflow for small and big-budgeted projects, leading to project approval, clearing the deck

for research implementation. In addition, the mandatory requirement of submitting research progress and final reports was explained, as well as acknowledging RS grant support, Prof. Nejb further laid emphasis on research productivity, with published papers being the prime indicators of the quality and impact of research, for which access links for journals of high impact were provided at RS website, facilitating and identifying the ranking status of refereed journals in specific fields of research, and making appropriate choices for publishing research outputs. He also demonstrated the *Scientific Publications Search Page* service for accessing RS database on publications of KU faculty members in refereed journals, through keywords that include search by faculty, department, or authors. He further demonstrated the electronic submission of applications for grant support, as well as e-refereeing of research proposals, towards rapid approval of grants. Several awards,

(Contd. P.12... )▶

► **RS-AMandumah agreement...(From.... P5)**

and scientific institutions. The agreement would involve AMandumah in the inclusion and display of APC's Arabic scientific journals, and research studies within its databases, for access and reference needs of researchers and readership in the Arab World, as well as attracting interested researchers to publish their research in the Council's journals.

The signing ceremony was organized by Prof. Obaid Al-Otaibi, Asst. Vice President for Research, who welcomed AMandumah delegation, and outlined the purpose of the collaborative agreement. Also present at the signing event were the Assts. Vice President, Prof. Haitham Lababidi and Prof. Nejb Smaoui, from RS, as well



▲ A line-up of RS-AMandumah participants

as AMandumah's Consultant, Dr. Musaid Al-Tayyar.

► **KU-KISR agreement...(From.... P3)**

from graduates and postdoctoral researchers, being prevalent in elite universities worldwide, is an aspect which remains untapped here, and is a dire necessity for nurturing a new breed of scientific talent so essential for innovative and creative endeavors, and for developing human capital.

For the Research Sector, the agreement was the significant revival and renewal of the collaboration between KU and KISR, with the ceremonial event marking its activation, bringing together the signing parties in the joint pursuit of research, that serves national goals, develops efficiency, generates new technology, and encourages scientific innovation and creativity. Highlighting the key goals of the agreement, Prof. Al-Sanad, expressed the need for practical steps towards implementing joint projects, and setting plans and priorities that ensure appropriate utilization of expertise, potentials and resources available across both institutions. The focus would also be on identifying areas of mutual strengths, and initiating coordinated efforts and energies in addressing key issues and problems, as well as in the areas of renewable energy and solar cell tech-

nology, while citing the example of *Shaggaya* project. The agreement also entails reciprocal visits between the two institutions, and organizing joint scientific sessions, exchanging expertise, and outlining strategic plans and joint research within the framework of governmental program and strategy, including joint funding of projects relevant to national needs and priorities. The focus would also be on developing indigenous capabilities and caliber of faculty and graduate students through advanced and innovative research, training and manpower development.

For KISR, the agreement was a critical step towards sharing scientific potentials and benefitting from KU capabilities and expertise, including advanced infrastructural and facilities to implement research and for meeting national developmental goals, while meeting the aspirations of Kuwaiti society. Sharing his thoughts on the



▲ Participants at KU-KISR ceremonial event

occasion, Dr. Al-Mutairi, expressed the need for pursuing joint research in areas of mutual interest, and exchanging technical expertise, information, equipment and facilities for project implementation and follow-up matters. He also expressed the need for graduates participation in scientific research, and supported coordinated efforts in advancing the field of graduate studies research at KU, under joint supervision. The need for joint release of scientific publications, based on research outputs, was also highlighted, in addition to the provision of secondment of faculty members to KISR and vice versa, for enhancing the sphere of scientific studies and research.

**KU's initial focus is on developing the main concept of the Research Park**

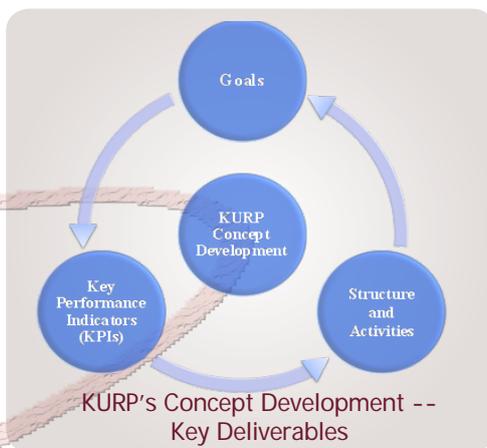
*RS started implementation of the Virtual Research Park with effect from September 1, 2013*

**Research Sector moves beyond the concept and key findings of the empirical study on establishing Kuwait University Research Park (KURP), taking explicit steps towards Implementing the park's roadmap**

*Ongoing efforts aimed at identifying core elements for transforming KURP into a vibrant scientific entity, through KU's research strengths, intellectual caliber, internal & external partnerships, and sustained flow of capital*

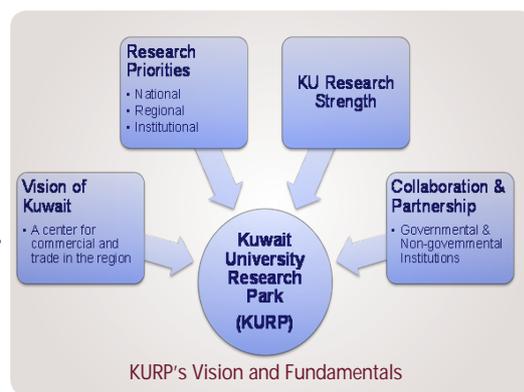
Moving beyond the concept and key findings of the empirical study on establishing Kuwait University Research Park (KURP) at the Sabah Al-Salem University City, Shadadiya, the Research Sector (RS) has initiated explicit steps towards implementing the park's roadmap in a determined bid to actualize the park's idea and ideology into practical reality. The project's initial focus is on developing the main concept of KU Research Park, for which RS explored and identified the core elements that are imperative for transforming the current research support system at KU into a vibrant scientific entity, through effective utilization of KU's research strengths, intellectual caliber, internal and external partnerships, and most importantly, the sustained flow of capital. Apart from KU budgetary support, the park would necessarily require additional avenues of funds, generated from multiple sources, such as industrial, public and private sectors, companies, tenants, donors, endowments, institutions, or through research investment, being vital ingredients for continuous and sustained progress in developing the park. In the interim, RS proceeded with necessary steps towards the establishment of KURP from September 1, 2013, with the launching of the "Virtual Research

KURP's model advocates a two dimensional approach -- developing institutional capabilities and capacity for advanced and innovative research, and generating IPs



Park" stage, constituting an integral part of the implementation roadmap that defines a complete executive plan for the physical realization of KURP.

Essentially, the park's concept and vision evolved during the course of RS continuous efforts, and following a widely representative concept development workshop, organized by RS on June 14, 2011, with key faculty executives expressing the need for developing KURP's concept and vision within the framework of government



approved plan and strategy. Following the workshop, RS initiated an empirical study\* for scientifically determining KURP's concept, activities and strategy, which was accomplished over a six-month's period (September 2012 through March 2013). The study, funded by KFAS, followed an explicitly defined methodology, leading to a series of personalized meetings, interactive sessions, as well as site visits, both within and outside Kuwait. These visits and meetings provided the opportunity for observing the functioning, management and activities of university-based science, technology and research parks, including key elements, focus areas, and flourishing scientific activity in some world renowned universities

**(Contd. on ... P.9)**

**\*Study team:**

- Prof. Haitham Lababidi (Asst. Vice President for Research, Research Sector)
- Dr. Tariq A. Al-Dowaisan (Industrial & Management Systems Engineering, Faculty of Engineering & Petroleum)
- Dr. Promila Sharma (Director, Technical Information & Publications, Research Sector)
- Engr. Fatema Al-Awadi (Industrial & Management Systems Engineering, Faculty of Engineering & Petroleum)

► **RS starts KURP's implementation...(From P.8)**

and institutions, known for their vast experience, expertise and commercial aspects of research.

This exposure was immensely valuable in recognizing the parameters that could *indigenously be applicable within the scientific and cultural environment of Kuwait*, and could provide the basis for evolving KURP's conceptual framework.

The study's outcome resulted in defining the fundamentals for KURP's concept, with the findings unveiling the core elements of the park, that formed the basis for generating the Executive Summary providing the holistic view of the project, critical elements for which are summarized below:

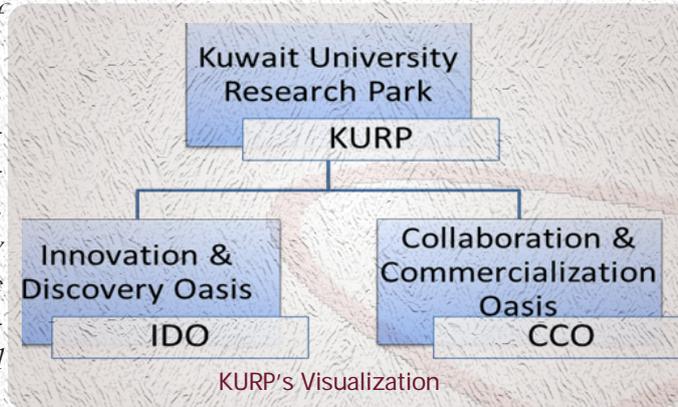
- **Vision:** KURP's is envisioned to be a *key driver of innovation, economic, and societal development in the State of Kuwait.*
- **Mission:** KURP's mission is to *nurture applied and multidisciplinary research, commercialize research outcomes, incubate and establish new businesses, and collaborate with relevant research, governmental and non-governmental institutions.*
- **Strategic Objectives:** KURP's strategic objectives are:
  1. *Participate effectively in diversifying and growing national economy, and creating new and value-added job opportunities.*
  2. *Create a transformational change in research performance, resulting in uplifting the stature and ranking of KU worldwide; and*
  3. *Develop national capabilities in*



*advanced technology and entrepreneurship, to ensure the development and prosperity of the Kuwaiti society.*

- **Fundamental Framework** KURP's fundamental framework essentially revolves around two major Oases:

1. *Innovation & Discovery Oasis (IDO)* aimed at developing applied scientific research, primarily



2. *Collaboration & Commercialization Oasis (CCO)* aimed at providing a venue for collaboration with local and international institutions, and benefiting from research outcomes for economic and societal development.

- **Park's Key Functions:** These include:
  1. *Nurturing Research & Innovation*
  2. *Corporate Relations & En-*

*agement*

3. *Technology Commercialization*
4. *Incubation & Spinoffs*
5. *Entrepreneurship & Capacity Building; and*
6. *Public Relations & Marketing.*

- **Innovation Focus Areas (IFAs)** were identified as a result of elaborate analysis of KU's areas of research strength, national and university priorities, and personalized interviews with a systematically identified community of researchers, and broadly include:

1. *Services and computing systems*
2. *Health services, diagnostics, drugs and therapeutics*
3. *Alternative & Renewable Energy and Environment; and*
4. *Advanced Materials.*

These areas enabled the identification of potential projects within each IFA, with requisite summary briefs prepared. By and large, these projects were multidisciplinary, holding economic and social impact.

- A **Phased Implementation** strategy of KURP

**(Contd. on ... P.23)**

**Advanced research in the areas of renewable energy and silicon solar cells technology consistently dominates Kuwait University's priorities**

Kuwait on the threshold of *Shagaya Renewable Energy Multi-Technology Park*, the mega project, proposed by KISR, critically relevant to country's developmental needs, priorities, and growing energy demands

**Optimum performance of PV panels would necessitate due consideration of environmental implications**

Advanced research in the spheres of *Renewable energy* and *silicon-based solar cells technology* has consistently dominated research priorities at Kuwait University since 1988/89, when the first listing of priority research areas was announced by the Research Sector. Since then, renewable energy has continued to configure in periodic updates of priorities at KU during 1995/96, 1998/99, 2009/10, 2010/11 and the current priorities, enlisted for the next two years until 2014. It is within this priorities frame that research in the areas of *alternative energy*, *photovoltaics* (PVs), and *solar cells technology*, has actively involved KU researchers in jointly pursuing research in partnership with external institutions, which as recently as Dec. 19, 2012, laid the basis for KU's long-term collaborative agreement with IMEC, the world-leading nanotechnology research center at Belgium. This agreement marked a strategic step towards advancing institutional capabilities in the sphere of innovative *silicon solar cells* technologies, and KU's decisive moves towards exploring the dimensions of renewable energy, in recognition of its significance for Kuwait and the region.

This bonding was particularly significant for KU researchers, to work in close coordination with IMEC,



A view of Solar Panels



KU-IMEC agreement on Silicon Solar Cells technology

and acquire wider perspective, skills and understanding of the ground realities, in view of Kuwait's environmental and climatic conditions, impacting the utilization of PV as an alternative energy resource. It is precisely in this context, that Dr. Yaser Abdulraheem drew attention to the

inherent environmental challenges that could compromise the efficiency and effectiveness of PVs and silicon solar cells. Dr. Yaser is from the Electrical Engineering Department, faculty of Engineering & Petroleum, Kuwait University, who is working in close coordination with IMEC and heading KU's PV research team, while having extensive experience and expertise in developing crystalline silicon PV technologies. That, renewable energy is important for Kuwait is unquestionable. However, the optimum performance of PV panels would necessitate due consideration of environmental implications for curtailing the impact of extreme temperatures, relative humidity, dust storms

(Contd. P.11... ▶)

## ► Silicon Solar Cells Technology ...(From.... P.10)

and sand accumulation. The climatic factors would, therefore, require attention in designing the solar cells technology.

Having recognized the significance of *renewable energy and silicon solar cells technology*, Kuwait is on the threshold of *Shagaya Renewable Energy Multi-Technology Park*, a 70 MW venture, the bidding process for which was opened over a year ago in June 2012. The mega project is as significant as it is critically relevant to the country's developmental needs and priorities, and for meeting the country's growing *energy demands*. The park's blueprint, inclusive of a 10 MW PV plant, reportedly is to be accomplished in three phases, the first phase of which is scheduled for completion by the year 2016, for which a 100 sq. km. site has been allocated at Shagaya for the facility, about 100 km west of Kuwait City.

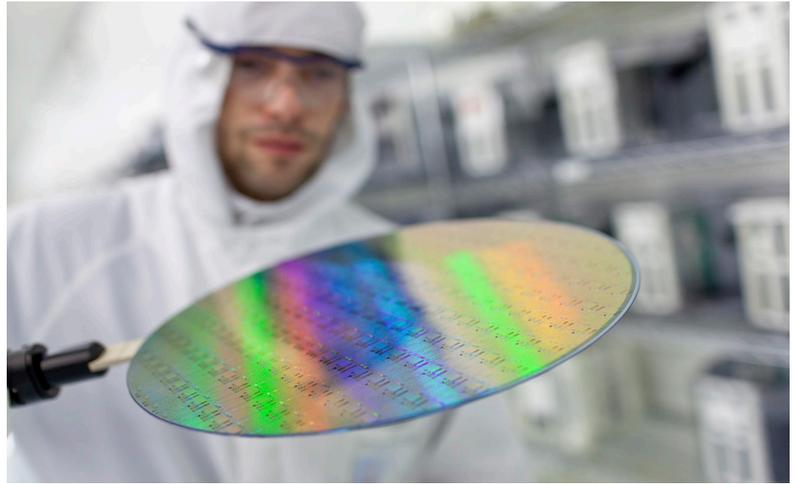
A major challenge to such facility is the frequency of sandstorms that average around 26, per year far exceeding the normal average in neighboring countries. During sandstorms, the sand particles, bombarding the protective layers and anti-reflective coatings of PVs at high speed, cause serious mechanical damage to solar cells. Besides, the accumulated sand on panels require cleaning operation at an additional cost for safeguarding the facility. Even the suspended sand particles in air, tend to reduce solar radiation per unit area by scattering light, causing the solar cell modules output power to drop.

Humidity too impacts on PV installations, when the air heavily

laden with water vapor condenses on PV panels, affecting their optical performance, and causing short-circuiting. Hence, the humidity factor also needs to be duly accounted for in the facility's cost, to ensure solar cells effectiveness, making the dollar per watt value higher than expected.

Kuwait has the highest direct normal solar irradiance in the GCC region, averaging solar radiation of about 2,000 kWh/square meter. This abundance, with year-round uninterrupted sunshine, in fact could degrade solar cells performance. In Dr. Yaser's views, the daytime temperatures during the summer months invariably reaches above 45° centigrade, affecting the electronic and optical performance of solar cell devices, with long-term implications for their *aging*, and *lower operational lifetime*.

The winter months likewise affect the efficiency of solar cell devices, with the desert temperatures dropping down to nearly 0° centigrade, hence, summer-winter temperature variants need to be duly considered for retaining the operational momentum of solar devices. Dr. Yaser believes, the best option for developing large scale PV plants in Kuwait, is the careful choice of technology



► Renewable energy & Silicon Solar Cells-- Courtesy IMEC

that ensures efficiency, and highest electric power generation, for which gallium based, multi-junction modules is the ideal technology for achieving highest efficiency. However, the rarity of this element and production process would automatically increase the cost of PV modules, out-weighing the benefits. The crystalline silicon PV is an alternative that could ensure highest efficiency, at a reduced costs. The element occurs in abundance, and silicon-based modules can provide efficiency at a reduced cost, offering an attractive and economically feasible option, for high-efficiency solar cells, at a competitive dollar per watt value amongst other PV technologies.

Currently, the ongoing R&D activity in the sphere of crystalline silicon PVs is focused on developing thin crystalline silicon PV devices, that ensure high efficiency, and reduce production costs. In this context the KU-IMEC multi-partnership research program, partly funded by Kuwait Foundation for the Advancement of Sciences, is driven towards reducing the thickness of active layers in single crystal silicon solar cells, from the conventional thickness

(Contd. P.30... ►)

► RIG session orients new Kuwaiti faculty members...(From.... P6)

rewards and incentives were also offered by RS to researchers and graduate students for distinguished research, and for publishing in top-ranking journals.

Prof. Haitham focused on the implementation aspects of research projects, and the processing requirements for needed resources, outlining key elements of the research budget, purchase, equipment and laboratory supplies, petty cash, manpower and scientific missions. Explaining that the RIG grants had fixed budget and duration, he mentioned that all rules and regulations related to implementation of research grants are included in the manual, which has been recently updated for the third time. The manual is available on the RS websites, electronically and on CDs, and as hard copies. Prof. Haitham also dwelt on RS consistent efforts towards improving services, and facilitating researchers, with a briefing on the recently introduced *English Language Editing Service*, in coordination with the Nature Publishing Group (NPG) for improving the quality of research manuscripts for publication in top ranking journals of impact. He encouraged the young assistant professor researchers to benefit from this service, which will substantially enhance the quality of their manuscript, in preparation for publishing in highly ranked journals.

Prof. Obaid presented an overview of the mission, objectives and responsibilities of the Office of External Research Collaboration & Consultation, with its key programs focused on *technology transfer*, *consortia* and *task force groups* for specialized studies in areas of national needs and priorities,

*collaboration and partnerships* with external institutions and industry, and *investing and marketing research*. The office also identifies research priorities, lays policy, legislative and procedural framework for patents registration, intellectual property rights, copyrights and trademark, in addition to matters concerning ethics, and researchers rights, and developing policy framework for legal protection concerning

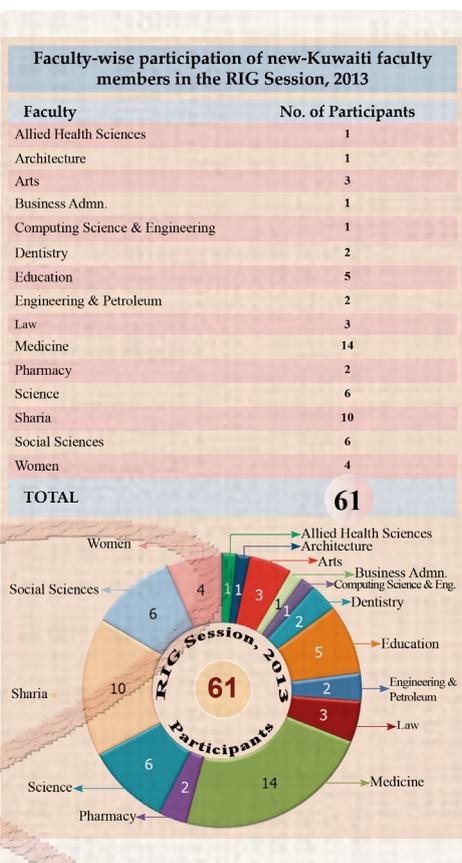


▲ RIG session in progress...!

*Dental Company, Astrazeneca, Sabah Al-Ahmad Center for Creativity & Giftedness, Ecophile, KPC, KOC, UNEP, UNESCO, and National Guards.*

These presentations provided a dynamic outlook of the RS research support system, and facilities for availing grants, with RIG grants specifically earmarked for new Kuwaiti faculty members as a start-off activity, prior to moving towards more advanced and comprehensive research in *basic and applied sciences*, and in *arts and humanities*.

In all, 61 new Kuwaiti faculty members participated in the RIG session, with (Table 1) providing faculty-wise distribution of participants, gathering first-hand information on KU's research *policy, procedures and requirements*, including RIG grants, and electronic submission of applications through OVPR/RS websites. The session generated immense interest among the participants, culminating in an interesting question-answer round, with RS panel of Assts. Vice President providing answers to the queries raised, details of which are presented on OVPR/RS websites [http://\(www.ovpr.kuniv.edu.kw](http://www.ovpr.kuniv.edu.kw) & [http://www.ovpr.kuniv.edu.kw/research\)](http://www.ovpr.kuniv.edu.kw/research).



scientific inventions and discoveries. Consultations are also offered on investment and commercial aspects of research, and mechanism evolved for assessing scientific inventions and products of commercial propensity. He also exhibited RS current partnerships network that involved scientific collaboration with *Delaware State University, University College London, British Council, IMEC, 3M, KFAS, Shofu*

## ► *RS remodels strategy— VPR's Message...(From... P3)*

entry of the newly established *college of Computing Science & Engineering* in mainstream research, with one project. A similar move from the *college of Architecture* is desirable.

Another significant development was the extensive updating and reformation of the Research Support manual, 2013, including *additional chapters, new clauses and bye-laws for grant support*, offering researchers a *facilitative and flexible* procedural framework, *including opportunities for incentives and awards*, with the *e-manual* released, and accessible on RS website ([http://www.ovpr.kuniv.edu/rr/RSYRL\\_EN.htm](http://www.ovpr.kuniv.edu/rr/RSYRL_EN.htm)). RS incentives stimulus is already proving its worth and value, with 218 *beneficiaries* winning the *incentives rewards* for high quality outputs from *funded* (39.4%), and *unfunded* (60.6%) research, as well as for excellence in *project final report*, during the calendar years (2010, 2011, 2012 and 2013). On the collaborative front, 52 projects are currently being pursued in partnership with 11 external institutions (*KFAS, KPC, UNESCO, KOC, KNPC, KNG, UNEP, AstraZeneca, IMEC, Shofu Company and 3M*), while new agreements with *KU-KISR* and *Saudi Dar AlMandumah Institution* have recently been signed on Oct. 23, 2013, and Oct. 24, 2013, respectively, further expanding the institutional collaborative horizons through tie-ups with local, regional and external institutions worldwide. Enhancing scientific collaborations with external institutions would continue to dominate RS efforts in the interest of pursuing large-scale multidisciplinary studies, that need diverse expertise and input for addressing emerging issues and scientific complexities facing science, society and mankind. Such studies invariably require competitive, credible and globally relevant research.

The global aspect is simultaneously being explored with RS efforts towards developing institutional capabilities and capacity for high quality research, through world class infrastructure, facilities and assets. Several new initiatives have been taken for this purpose through *exploratory, empirical and investigative* studies, and key findings discussed, and adopted during 2012/13. These included the establishment of *Specialized Research Units & Laboratories (SRUL)* as a *new grant support category* within the existing research support system, with RS currently offering *10 Types of Grants* to faculties. The newly established SRUL category has already been activated with the approval of two projects during 2012/13, one each for the faculties of Medicine and Science, and all faculties have been invited to submit new proposals for developing their research facilities and resources through SRUL grants, for pursuing high quality

innovative research. RS challenge, however, is to sustain faculties interest, and innovative abilities for conceptualizing and transforming ideas into meaningful research that could yield potentially significant results and new knowledge through scientific discovery. A favorable climate is also being created for quality, partnership, ideas and spinoffs that could be translated into commercially viable products through innovation and invention. RS intense efforts in this direction concerned the explicit outlining of the conceptual framework for establishing *Kuwait University Research Park (KURP)*, an initiative of immense significance, which was empirically investigated, and an extensive report *submitted, discussed and approved* during 2012/13. KURP's objectives were in line with the government approved strategic plan, and the study's findings specified the park's idea, ideology, vision, and *implementation roadmap*, with suggestions for setting up a *virtual park*, prior to moving ahead with the park's phased implementation. A real-time action has already started on the plan's implementation, with RS working on identifying faculties expertise and research strengths, and gearing up for moving mature areas of scientific and commercial propensity to the park's environment, to be developed as hubs of scientific innovation and excellence, where young faculty and graduate students could be trained and their talent effectively utilized for developing institutional capacity for world class research and spinoffs.

RS is also encouraging a climate of *scientific openness* in faculty research through annual posters events, providing opportunities to scientific and humanities researchers to display their research accomplishments at the posters forum. In addition, Distinguished and Best Young Researchers, Graduate Students, and Patent recipients are annually being awarded and honored for their distinguished research accomplishments, and faculties are continuously being informed and updated on latest research developments through publicity, publications, websites, workshops, seminars, contacts, and communication. Above all, RS is continuously developing a system of *effective governance* in grants management, and matters of *quality, performance and productivity* are being given attention so that faculty research gets listed in *international databases*, figures on *competencies listings*, and is effective in improving KU's *scientific standing and ranking*. These priorities form the *core of RS mission* ahead, laying the future roadmap for developing institutional research towards realizing Kuwait University's global aspirations, and elevating its world presence and profile. RS quest in this direction is beginning to gather steam...!

**Prof. Hasan Abdulaziz Al-Sanad**  
Vice President for Research

## Research Reward Recipients

The Distinguished Research Series brings its *Fifth* consignment of high quality research, published in internationally renowned journals of impact, as per JCR rankings, significantly reflecting on the quality of research at Kuwait University. The series is primarily meant to display and highlight scientific accomplishments of faculty researchers, who achieved international recognition on grounds of the *quality, credibility* and *impact* of their published research, receiving wide scientific acclaim, and appearing in top ranking journals of impact, an *internationally accepted and applied marker of distinguished research*. This factor is an *accepted standard* for RS in determining the quality of faculties scientific outputs, generated from *funded* and *unfunded* research, as well as for competitive assessment of *project final report* receiving *excellent rating*, qualifying the concerned researchers for *incentive rewards* in appreciation of their distinguished research, and as a stimulus to gain further mileage in their future research endeavors.

For readers information, incentives rewards were instituted by RS in the year 2010 as a motivation for faculties to improve the quality of their scientific research, which could elevate KU's status among elite, world class universities, known for their scientific *competence, caliber* and *quality*. Initially instituted for two years, the incentives continuity was re-examined in March 2012 by the University Council, to assess its effectiveness as a *quality-enhancement factor*, with supportive statistics demonstrating its key role in improving faculties published research record on quality grounds, clearing the deck for the incentives continuity as a vital element in *advancing knowledge* and *internationalizing KU* research. This series is crucially linked to the attainments of that distinguished community of faculty researchers, who adopted the virtues of *quality, distinction* and *impact* in their research efforts, and won recognition for their distinguished research outputs.

RS is maintaining an exclusive database on the beneficiaries of incentives stimulus, as well as the quality of institutional research, which is showing visible improvements, as exhibited by the growing number of incentive reward recipients, which currently total 218 beneficiaries, based on available statistics for the last four calendar years (2010, 2011, 2012 & 2013). These include 67 (30.8%) incentive rewardees for funded research, 103 (47.7%) for unfunded research, and an additional 48 (22%) for excellence in project final report. This series is aimed at *disseminating the distinguished accomplishments* of the reward winners, and sensitize the scientific community worldwide on the *quality and standard of research at KU*, in a bid to spread awareness, promote scientific interaction, and raise collaborative possibilities. Given this broad purpose, Distinguished Series – 5 presents summarized research results of next *four* incentive rewardees on *RS list*, outlining key findings of *two* researchers for *funded research*, the *third* for *unfunded research*, and the *fourth* for *excellence in project final report*. The research summaries are directly provided by the reward recipients, and presented here for wide dispersal and public awareness. Series – 5 is focused on the research accomplishments of Dr. Hossein Soroush (*Funded Project SS04/07*), Dept. of Statistics & Operational Research, Faculty of Science; Dr. Mohamed F. Yassin (*Funded Project WE01/08*), Dept. of Environmental Technology & Management, College for Women, Prof. Moustafa Ghannam (*Unfunded Research*), Dept. of Electrical Engineering, Faculty of Engineering & Petroleum; and Dr. Mohammed A. Zahid (*Project Final Report – MQ01/05*), Dept. of Psychiatry, Faculty of Medicine. The inclusion of summaries is based on the principle of first-come, first-served. (*Kindly Note: The summaries, findings and views expressed herein are entirely those of the researchers*).

### Single Machine Scheduling with Inserted Idle Time to Minimize a Weighted Quadratic Function of Job Lateness

H. M. Soroush

Dept. of Statistics & Operational Research, Faculty of Science

(Project No. SS04/07)

In the majority of scheduling problems in production or service organizations, early as well as late completions of tasks

are undesirable to both customers and manufacturers or service providers. This is compatible with the philosophy of the

just-in-time (JIT) system that emphasizes completing tasks on their due dates,

(Contd. P.15... ►)

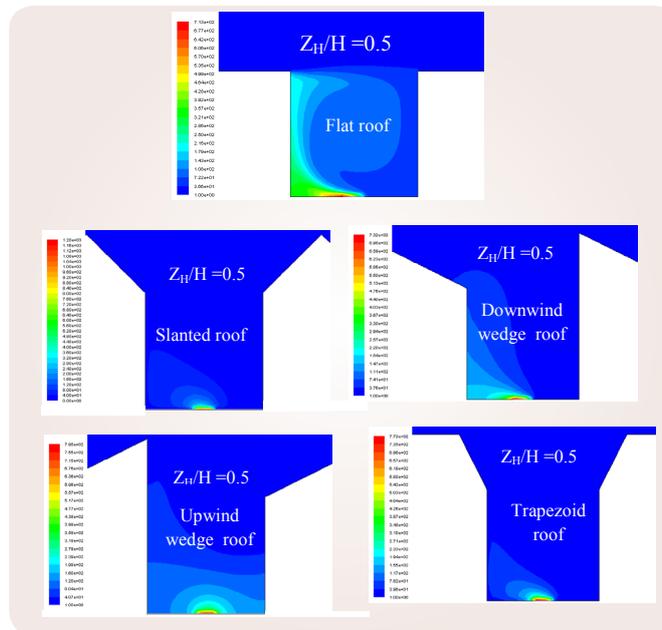
## Impact of height and shape of building roof on air quality in urban street canyons

Mohamed F. Yassin

Dept. of Environmental Technology & Management, College for Women

(Project No. WE01/08)

Air quality within an urban street canyon is influenced by traffic flow and its emissions, urban background concentrations, ambient meteorological parameters, and building geometry configurations such as roof shape, building roof height, street width, etc. A building's roof-shape and roof height play an important role in determining pollutant concentrations from vehicle emissions and its complex flow patterns within urban street canyons. The impact of the height and shape of building roof on wind flow and dispersion of gaseous pollutants from vehicle exhaust within urban canyons were investigated numerically using a Computational Fluid Dynamics (CFD) model. Two-dimensional flow and dispersion of gaseous pollutants were analyzed using standard k- $\epsilon$  turbulence model, which was numerically solved based on Reynolds Averaged Navier-Stokes (RANS) equations. The diffusion fields in the urban canyons were examined with three roof heights and



five roof shapes: (1) flat-shaped roof, (2) slanted-shaped roof, (3) downwind wedge-shaped roof, (4) upwind wedge-shaped roof, and (5) trapezoid-shaped roof. The numerical model was validated against the wind tunnels results in order to optimize the turbulence model. The numerical simulations agreed reasonably with the wind tunnel results. The results obtained indicated that the wind velocity

increases with the flat roof, slanted roof and trapezoid-shaped roof, but decreases with the downwind and upwind wedge-shaped roofs. The wind velocity decreases as the roof height increases. The turbulent kinetic energy increases with the slanted-shaped roof but decreases with the flat-shaped roof. The turbulent kinetic energy increased as the roof height increased with the four roof shapes. The pollutant concentration increases as the roof height decreases. The pollutant concentration increases with the flat-shaped roof, but decreases with the slanted and trapezoid-shaped roofs. This work is considered as guidelines to assist engineers to select the best design for the roof shapes of building in street canyon

### ► Single Machine Scheduling ...(From.... P.14)

neither early nor tardy. Tasks that are finished early tie up capital, raise inventory costs, and indicate sub-optimal resource allocation and utilization. On the other hand, tasks that are finished after their due dates may cause loss of profit and good will, overtime, opportunity costs of lost sales, or operations shut down.

In many real world scheduling environ-

ments, both early and late completions of a task are equally penalized where the amount of this penalty grows at an increasing rate as task completion time deviates from its due date. Hence, task deliveries that are quite early or tardy are more heavily penalized. In fact, in a great number of settings, the penalties of non-conformance with due dates do indeed increase in severity in a non-linear,

particularly quadratic, fashion. Moreover, in most scheduling problems with earliness and tardiness penalties, schedules that have idle times before tasks may be preferable to the ones without idle times. The insertion of idle times may be allowed in two ways. First, an idle time is inserted in front of each task. Second, an idle time is inserted only before the start of the first

(Contd. P.34... ►)

Analysis of thin-film silicon solar cells with plasma textured front surface and multi-layer porous silicon back reflector

Moustafa Y.Ghannam<sup>a</sup>, Ahmed A.Abouelsaood<sup>b</sup>,  
Abdulazeez S.Alomar, Jef Poortmans<sup>c</sup>

<sup>a</sup>EE Department, College of Engineering and Petroleum, Kuwait University

<sup>b</sup>Department of Mathematics and Physics, Faculty of Engineering, Cairo University

<sup>c</sup>IMEC, Leuven, Belgium

(Unfunded Research)

During the last decade different techniques have been proposed to fabricate thin crystalline silicon solar cells on non-silicon as well as on cheap silicon substrates. The goal is to achieve a reasonable efficiency that makes such cells cost-effective compared to wafer-based crystalline silicon solar cells. In thin cells, however, light trapping (optical confinement) within the cell is necessary to maintain reasonable light absorption in particular in the medium and long wavelength range. Efficient light diffusion in the cell is necessary to ensure successful light trapping, which can be achieved using a Lambertian reflector at the backside and/or a textured front surface.

In the present work a rigorous ray tracing model is developed to predict the carrier generation and the optical performance of the structure sketched in Fig. 1, consisting of a thin cell having a textured front surface and implementing a Bragg reflector at the back side made of a stack of porous silicon layers with alternating high/low porosity. The model is based on the solution of the integral equations for light propagating and reflecting back and forth at different angles between the back and front surfaces and includes 1) diffuse reflectance and transmittance for light incident on the front surface from the outside, 2) diffuse reflectance and transmittance for light incident on

the front surface from the inside, 3) specular reflectance and transmittance of the surface as functions of the angle of incidence on the front surface from the inside, 4) reflectance at the back surface of the epitaxial silicon layer, taking into account multiple

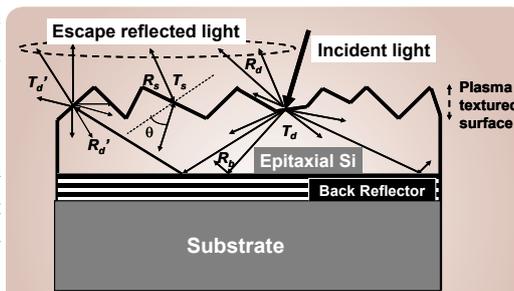


Fig. 1. Thin-film silicon solar cell with a Bragg back reflector porous silicon stack and random plasma textured front surface.

reflections and interference effects within the porous stack. The analysis uses a separate model for the determination of the refractive index of porous silicon that is more accurate than the widely used effective medium model of Bruggeman.

The results of the theoretical analysis are compared to those experimentally obtained for a demonstration cell (demo-cell) fabricated and characterized at IMEC. The sensitivity of the photocurrent to the cell thickness and to the parameters related to light trapping and to surface and bulk recombination is investigated.

The photocurrent is calculated and plotted in Fig. 2 as a function of the epitaxial layer thickness. Three different cells are compared: 1) cell with a porous Si stack back reflector, 2) cell with a perfect back reflector and 3) cell with no back reflector, for two conditions: 1) practical collection with recombination parameters appropriate to the structure and material under study, 2) cell with ideal unity collection. With porous Si stack back reflector the current peaks at 27.17 mA/cm<sup>2</sup> when the epi-layer is approximately 25 μm thick. With a perfect back reflector the current peaks at 30.34 mA/cm<sup>2</sup> when the epi-layer is 11 μm thick which confirms the significant advantage of a good back reflector in terms of reducing silicon consumption. With no back reflection, the current continues to increase with increasing cell thickness and finally saturates at 26.1mA/cm<sup>2</sup> for a cell approximately 25 μm thick. On the other hand, for the ideal unity collection(zero recombination) situation, the current continues to increase with increasing the epi-layer thickness. The current saturates when the epi-layer is 50 μm thick at 35mA/cm<sup>2</sup> with a porous silicon stack reflector or ultimately at 38 mA/cm<sup>2</sup> when the back reflector is perfect.

(Contd. P.30... ▶)

*The dimensions of psychopathology,  
quality of life and quality of care  
and their associated factors in a sample  
of Kuwaiti subjects with schizophrenia*

*Muhammad A. Zahid<sup>1</sup> and Jude U. Ohaeri<sup>2</sup>*

<sup>1</sup> *Department of Psychiatry,  
Faculty of Medicine, Kuwait University*

<sup>2</sup> *Department of Psychiatry,  
Psychological Medicine Hospital, Kuwait.*

**(Final Report of Project No. MQ 01/05)**

### **Objectives:**

This study was aimed at identifying the patients suffering chronically from schizophrenia at Kuwait's psychiatric hospital, and assess their psycho-social needs, satisfaction with the quality of care services, subjective quality of life (QOL) and the effects of illness on the families (called family burden).

### **Method:**

Modified versions of the Camberwell Assessment of Need (CAN), The Client Sociodemographic and Service Receipt Inventory (CSSRI), Involvement Evaluation Questionnaire (IEQ), Lancashire Quality of Life Profile (LqoLP), and Verona Service Satisfaction Scale (VSSS) were used to quantify the above outcome variables.

### **Results:**

There were 130 patients (68.5% men), aged 14 – 61 (mean 36.8) years. Over 80% had at least high

school education, 35 (26.9%) were currently married, and 95.5% were living together with either their spouses or families of origin. The patients' general level of psychosocial functioning was average (GAF score = 50.2), while the mean BPRS (18 - item) score of 44.4 indicated that they were clinically "moderately ill".

Using the LQoLP, majority (56%) felt satisfied with the nine domains of life investigated, and 44.6% felt "averagely" happy. While over two-thirds expressed satisfaction with the VSSS domains of "overall satisfaction", "professionals' skills", "access", "efficacy", and "relatives' involvement", only about one-third were satisfied with the domains of "information" and "types of intervention." Using the CAN, the highest frequency of unmet needs was for money (29.2%).

About a fifth of subjects expressed unmet needs for six other items, including accommodation,

food, and self-care. The IEQ domain scores (total: 46.9; tension: 13.4; supervision: 7.9; worrying: 12.9; and urging: 16.4) were in the middle of the range for the EU data. Disruptive behavior was the greatest determinant of global rating of burden.

### **Significance and application of results to Kuwait and Gulf countries**

Despite generous national social welfare provisions, experience of family burden was the norm. Also, despite free health services and family support, a number of our patients had problems meeting basic needs and health care needs.

The weaknesses in the system, highlighted by the pattern of responses of the participants, indicate possible gaps in the provision of comprehensive psychiatric care in the country and obviate the need for public mental health education, including family education, and community based resources to enhance the quality of care. 

Key documents in line with RS strategy of promoting awareness and enhancing institutional global visibility

OVPR's publications an enduring platform for transforming massive pools of scientific information for world readership

RS publications profile institutional scientific developments in a strategic outflow of KU research activities and accomplishments for global outreach

The Research Sector's (RS) publications domain progressively moved ahead with new commitments, generating a series of documents, for the upcoming academic cycle 2013/14, encompassing critical research updates and information, in line with RS developmental priorities, and institutional expanding scientific horizons. Of vital significance was the third edition of the manual of *Research Support Rules and Regulations*, 2013, presenting the latest outlook of the institutional grants system, with expanded scope and substance, including new chapters and clauses, and refining the existing articles with new additions and updates.

The document was accorded top priority, requiring intensive review and preparations, inclusive of the production technicalities, with its release, timed for September 2013, at the onset of the academic year 2013/14. The new initiatives, developmental activities and ongoing programs constituted the scope of the other significant document, *RS Annual Report 2011/12*, presenting an analytical profile of RS accomplishments during 2011/12, and outlining the priorities ahead. Both key documents progressed simultaneously, generating immense heat in the sphere of production and related technicalities,



▲ A line up of recently released RS publications, 2013

Publications domain perpetually in the move with new consignments & commitments for upcoming documents

requiring scheduling adjustments for their early relay and release. In addition, RS also prepared and released the March/April 2013 edition of *OVPR's Research News-Letter*, with far wider scope and coverage, featuring key events, activities and happenings in the domain of scientific research at KU, including new collaborative agreements signed, events held, awards distributed, and seminars organized. Also, prepared was the updated *RIG Information Guide*, 2013, outlining latest guidelines and conditions, with its release timed for September 2013, along with RIG posters, announcing the scheduling of RIG orientation session.

These documents continued to involve the publications domain in a

perpetual cycle of tight time-lines, with urgency and demand for new documents keeping the production channels in full swing, driving the publications momentum towards simultaneous phases of *planning*, *assembling* and *authoring* new consignment of upcoming RS publications. RS current thrust now is critically focused on such prime documents as *Glance 2013*, *RS Newsletter Oct./Nov. 2013*, *Annual Report 2012/13*, and *Guide to Subject Areas*, 2013/14, all lined for immediate attention, marking a progressive continuum of RS publications in a dynamic outflow of strategic information on KU research policy, strategies and developments in institutional research, relaying vital information to faculties, scientific community, external institutions, and wider society. The purpose is continuous and sustained exposure of KU's scientific programs, activities and accomplishments, driving global readership to the *quality* and *extent* of scientific research at KU, in line with RS strategy of promoting awareness, and enhancing institutional visibility, and standing worldwide.

The significance of publications

(Contd. P.19...▶)

## RS Publications released...(From.... P.18)

activity is crucially linked to this key objective, resulting in gross production and release of major documents, in print and electronic formats, disseminating vital information on RS developmental profile and scientific accomplishments, within the framework of KU's mission and aspirations for globalizing institutional research.

This context precisely defines the significance and critical dynamics of publications activity in advancing institutional scientific profile worldwide, with massive pools of source information transformed and packed into key documents, delivering institutional research policy and priorities for global outreach. At this juncture, a huge publications agenda is already claiming RS attention, with a series of descriptive and analytical documents lined-up for preparation, alongside a similar production thrust on OVPR's other constituent offices, the *Academic Publication Council (APC)*, and *Center for Gulf & Arabian Peninsula Studies (CGAPS)*, equally involved in parallel production of an array of scientific periodicals and publications, released with sustained regularity to the expanding users-network. Summarized below are some of the latest publications, issues and editions released by each of the OVPR's constituent offices (*RS, APC and CGAPS*), during the period May through September 2013:

### I. Research Sector (RS) publications (May to September 2013)

- **OVPR Research Quarterly Newsletter, March/April 2013** -- Re-

leased in April 2013, *OVPR's Research Quarterly Newsletter* was a mega-issue, with a comprehensive coverage of RS major events and happenings, in an expanded 80-page Arabic/English edition, featuring RS key activities during the period January through April 2013. The highlight was on three scientific collaboration agreements signed with external institutions, which included KU-KFAS agreement on *stem cell research*, KU-IMEC agreement on *solar cell technology* and KU-KNPC agreement for *research and development*. In addition, the two posters events organized for sciences and humanities faculties were covered, new patent recipients listed, and seminars on e-journals, knowledge management, writing scientific papers covered. An analytical feature on 5-year outlook on KU funded and unfunded published research by impact/no-impact factor was a significant inclusion, in addition to the 4<sup>th</sup> consignment of the Distinguished Research Series. The newsletter also covered key points of the KU-IBM meeting, dental abrasion research, and visiting students delegation from Germany, in addition to presenting statistical update on faculty research activity during the period Sept. 2012 to March 2013, and an extensive article on latest OVPR publications released during January to March 2013. The Newsletter also covered the latest editions of scientific journals released by the Academic Publications Council (APC), as well as scientific productions of the Center for



Gulf & Arabian Peninsula studies (CGAPS). For readers information, the Research Quarterly Newsletter, March/April 2013 issue has been widely distributed and displayed on OVPR's website (<http://www.ovpr.kuniv.edu>). Published & Released (*in English and Arabic*).

### • Research Support Rules and Regulations, 2013

– A comprehensive Arabic/English manual, incorporating extensive updates, reformations, clarifications and new additions, was released in September 2013, presenting the third edition of the *RS Research Support Rules & Regulation, 2013*, outlining legislative framework and bye-laws governing institutional research. Generated with an enhanced scope and substance, the manual adds new chapters, clauses and conditions in response to developmental priorities and researchers needs, creating a compatible and responsive system that is flexible and attractive, increasingly drawing faculties to the realm of funded research. The faculty research community would, therefore, find inclusion of two new programs within the manual as chapters on *Research Chair and Postdoctoral Fellowship*, as well as *Specialized Research Units and Labs*, with rationale, conditions and requirements for each of the new programs, significantly opening new opportunities for advanced and innovative research. In addition, new funding levels, raised mission allocations, and facilities of new services concerning *statistical analysis and consultation*, *hiring Kuwaitis on projects*, and offering new *incentive reward to researchers* on successful com-



(Contd. P.20... ▶)

**RS Publications released...(From.... P.19)**

pletion of their funded project, add significant new dimensions in faculty research, spurring quality and creativity in faculty research. The new



manual, available both in print and electronic formats, is intended to serve as reference guide for researchers, providing first-hand information on the entire ramifications of the research support system at KU, with the e-manual providing an interactive electronic interface for online access to the legislative and descriptive guidelines on each aspect of the research support mechanism. Setting new standards, criteria, conditions and requirements, *Rules & Regulations 2013*, has already been released, and accessible on RS website ([http://www.ovpr.kuniv.edu/rr/RSYRL\\_EN.htm](http://www.ovpr.kuniv.edu/rr/RSYRL_EN.htm)), facilitating faculties in developing their research proposals in compliance to KU's latest policy and regulations. Published & Released (*in English and Arabic*).

**• RS Annual Report 2011/12**

-- Presenting an analytical profile on the Research Sector's progressive journey of *growth, expansion and accomplishments*, *RS Annual Report 2011/12* profiles institutional scientific devel-



opments in a dynamic cycle of *new initiatives, developments, ongoing programs, and future goals*, signaling the priorities and challenges ahead. The year's key activities focused on a *two-fold strategy*, involving RS in enhancing institutional *external profile*, and developing *internal strengths*. On the external front, RS expanded its partnerships domain signing new agreements with external institutions for joint studies and research, while on the internal front, its key initiatives concerned, organizing the *concept development workshop on Kuwait University Research Park (KURP)*, for gathering diverse views on the park's *idea, ideology and vision*, followed by an empirical study to determine the KURP's concept scientifically. Another initiative concerned establishing *specialized research units and laboratories* towards acquiring world class infrastructure, technology and resources for developing institutional capacity and capabilities for scientific innovation, quality and excellence in research, a draft proposal on which was circulated to faculties for their review and feedback. The existing *Research Support Rules & Regulations* manual was simultaneously updated for generating the third edition of the manual, and *workflow* for small-budgeted projects redefined. New *priority areas* were identified and announced, and *quality factor* received attention, with growth registered in the domain of published research in refereed journals of impact. The *scientific posters events* were organized for humanities and sciences faculties, and awards

distributed for distinguished and young best researchers, top posters, graduate students, and patent recipients. The faculty research showed visible incline in the number of projects awarded, ongoing and completed, and new programs on *Research Chair and Postdoctoral Fellowship* received significant launch. The Annual Report 2011/12, prepared in bilingual Arabic/English format, provides an explicit outlook of the prevailing dynamism in institutional research during 2011/12, summarizing new initiatives, developments and accomplishments in faculty research, with outlying challenges, setting the direction and framework for key programs, priorities and future goals ahead. Prepared & Reviewed and Released (*in English and Arabic*).

**• Research Initiation Grant (RIG) 2013**— Released in September 2013, *Research Initiation Grant (RIG)*,



provides further refinements and update on the RIG incentives grants, awarded to new Kuwaiti faculty members, joining various faculties/departments at the Assistant Professor's level. The Guide outlines eligibility requirements for RIG grants, including budgetary categories and limitations, the review process, project duration, research implementation procedures, and submission of final report on project completion. For all practical purposes, RIG grants provide an enduring and encouraging platform to

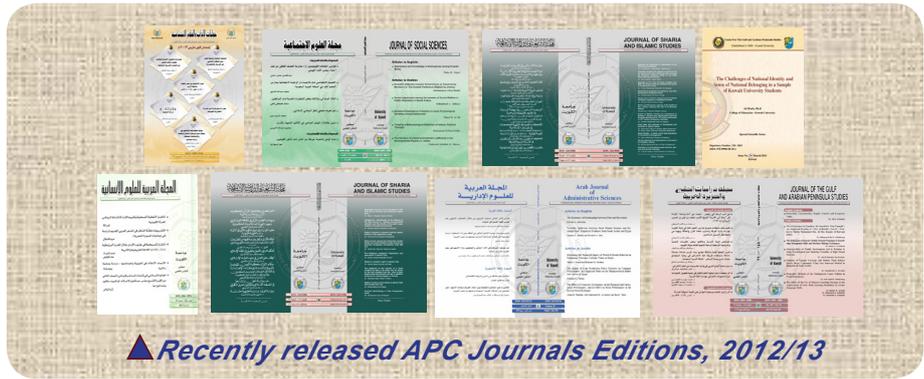
(Contd. P.21... ▶)

**RS Publications released...(From.... P.20)**

newly inducted Kuwaiti faculty members to pursue their scientific ambitions and be active participants in the institutional scientific advancement through their talent, ideas and innovation, utilizing RIG grants, as a starting step towards mainstream research through well-defined comprehensive studies. While the RIG Guide provides explicit information on acquiring grant support incentive for initiating research, the RIG Application, available on RS website, needs to be submitted electronically. The Guide also presents a visual outlook of the associated processing plan, outlining stages through which the RIG grant application progresses for approval, clearing the path for the project's implementation, together with the timeline, setting the period for project's completion within 12 months. RIG Guide 2013 has been released, and also posted on OVPR's website for *faculties* and *researchers* attention and access. Published & Released (in English and Arabic).

**II. Academic Publication Council (APC) Publications (May 2013 – September 2013):**

The Academic Publications Council (APC) has been equally prolific, with the periodic release of several new issues of various scientific journals of Kuwait University. During the period May through September 2013, following new issues and editions were released by the Academic Publication Council:



▲ Recently released APC Journals Editions, 2012/13

**Journals released Latest Issues released during the period (May 2013 - September 2013):**

- *Journal of Gulf & Arabian Peninsula Studies*, Vol. 39, No. 148, Jan. 2013.
- *Journal of Social Sciences*, Vol. 41, No. 1, 2013.
- *Annals of Arts and Social Sciences*, Vol. 33, March 2013.
- *Arab Journal of Administrative Sciences*, Vol. 20, No. 1, Jan. 2013.
- *Arab Journal of Administrative Sciences*, Vol. 20, No. 2, May 2013.
- *Journal of Sharia and Islamic Studies*, Vol. 28, Issue 92, March 2013.
- *Journal of Sharia and Islamic Studies*, Vol. 28, Issue 93, June 2013.
- *Arab Journal for the Humanities*, Vol. 31, No. 122, Spring 2013.
- *Arab Journal for the Humanities*, Vol. 31, No. 123, Summer 2013

**III. Center for Gulf & Arabian Peninsula Studies (CGAPS) Publications**

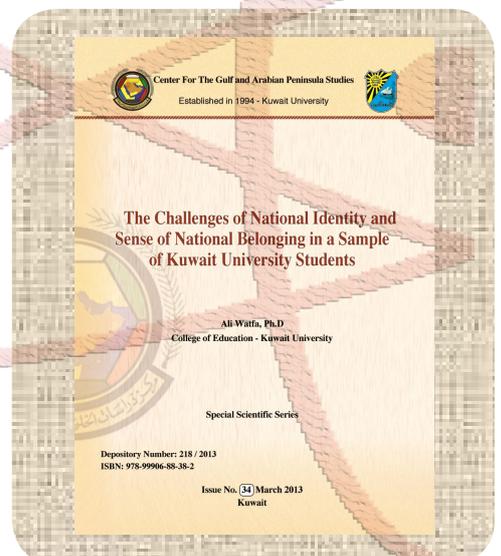
The Center for Gulf and Arabian Peninsula Studies (CGAPS) is progressively moving ahead with its programs and information resources, providing latest source documents and publications, periodically released by the Center, as below:

**A. Registry of Current Events in the Gulf & Arabian Peninsula Region:**

The document monitors and registers current events in the Gulf and Arabian Peninsula region, periodically released by the Center.

**B. Special Issues Series:** The document is a refereed scientific series, based on specialized research papers. The 34<sup>th</sup> recently released document in this category, profiles an analytical study, entitled:

- "The Challenges of National Identity and Sense of National Belonging



( Contd. P.28... ► )

*A greater understanding of food chain a key part of continuing research at the Tai National Park, a UNESCO world heritage site in Ivory Coast*

**Kuwait University Postdoctoral Research Fellow teams up with researchers from Florida and Ohio State universities for an international collaborative study on mechanical properties of primate foods**

*Research presents a unique opportunity to probe, discover and quantify data on mechanical properties of monkey foods to facilitate the understanding of primate jaws and teeth*

Fresh from his field trip in Côte d'Ivoire (Ivory Coast), West Africa, Dr. Adam van Casteren, a postdoctoral research fellow working on General Facilities Project GD02/11 for establishing the Dental Material Science Laboratory in the Faculty of Dentistry, was part of an international collaborative study investigating the mechanical properties of primate foods. This study brought together researchers from Kuwait University, University of Florida and Ohio State University, for gathering data and introducing novel field measurement techniques. The research took place in the Tai National Park, a UNESCO world heritage site, located in the far west of Ivory Coast, bordering Liberia. The park is one of the few remaining examples of pristine rainforest in West Africa. It is a vital conservation area providing a unique opportunity to probe, discover and quantify the mechanical properties of food consumed by monkeys inhabiting the forest. The research is intended to provide greater insights into the form of primate jaws and teeth.

The current research builds upon years of data already collected from the Tai National Park on what the monkeys eat. While there is a wealth of knowledge about

primate diets, very little is known about the mechanical properties of the food-stuffs, and its relationship to their dental-dietary adaptation. The key objective of the research was focused on this need, and required data collection on the mechanical properties of a wide range of seeds, leaves and fruits in tandem with training sessions for researchers in the novel research methods being introduced. These new methods are allowing us to present and answer questions about primate foods that were unanswerable previously in a field context. How hard are the nutshells that a mangabey eats? How tough is that leaf a colobus monkey is feeding on? When is this fruit ripe enough to eat? It is essential to measure, catalogue and compare the mechanical properties of a great many seeds, leaves and fruit to understand what makes the diet of each monkey unique, and how it manages to separate its own



▲ Research conducted in the Tai National Park

ecological niche from that of others it is competing with.

Arriving at the national park, Dr. Adam teamed up with researchers from Ohio State University, USA, Université de Neuchâtel, Switzerland, as well as long-term forest field assistants. The first task was to familiarize himself with the environment and diets of the Tai primates. This required sustained follows of various monkey groups, enabling the team to identify their specific dietary habits. With food samples in hand, Adam taught Erin Kane, a PhD student from Ohio

**(Contd. P.31...▶)**

► **RS starts KURP's implementation...(From P.9)**

revolves around “*Virtual Research Park*,” (VRP) involving explicit steps towards gradual operation of the research park, as an interim phase towards achieving the park's complete operational functionality, having progressed through the intervening phases of requisite studies, designs and facilities.

- A **Non-Profit Organization** is envisioned to be established for managing the commercial activities of the CCO for effective and efficient marketing of research and innovation outputs of the oasis, establish business incubators for new innovation and technology companies, as well as enter into agreements and alliances with leading companies and institutions, known for empirical research, development and innovation.
- An **Implementation Roadmap** characterized by taking concrete actions to immediately leverage and build on currently available assets; most notably the Research Sector's human and physical resources, backed by available infrastructure and buildings. Operational activities of the (VRP) have been categorized



in four phases: *Initialization, Startup, Transition and Physical Realization.*

The study team adopted a pragmatic view, taking several imple-

menting park's structural requirements, key activities, developmental strategy and implementation roadmap, setting the stages for transforming park's theoretical framework into practical reality. The report was submitted to KU President, and circulated to top management during May 2013, followed by review, discussions and deliberations, leading to the acceptance and approval of the concept, suggested strategy and developmental roadmap,

**Innovation Focus Areas (IFAs)**

- IFA I: • **Services and computing systems**
- IFA II: • **Health services, diagnostics, drugs and therapeutics**
- IFA III: • **Alternative & Renewable Energy & Environment**
- IFA IV: • **Advanced Materials**

mentation steps during the study period, where possible. This helped to validate and secure approvals by key university authorities, making it possible to proceed immediately with the actual implementation, much before the new Sabah Al-Salem University campus site is ready.

The concept development study led to an exhaustive report, presenting KURP's concept, vision, goals and objectives, as well as

clearing the deck for implementing the project and establishing the Park. Following the report's approval, the process for park's implementation has been initiated by RS, and grounds are being set for the park's virtual model, as the initial stage towards KURP's phased development, following the University Council's approval, paving the way for implementing the virtual research park, with effect from September 1, 2013.

Presently, RS major thrust is on enhancing faculties creative input, developing areas of strength, harnessing indigenous expertise, developing world-class infrastructure, improving quality and nurturing graduates talent. Efforts are also ongoing towards exploring avenues



(Contd. P.39... ►)

Event organized under the Distinguished Presence and Patronage of KU President

## Research Sector felicitates a distinguished community of faculty researchers and graduate students in a multi-awards ceremony

In a widely attended multi-awards ceremony, organized by the Office of the Vice President for Research, the University Council hall was the venue for honoring a distinguished community of faculty researchers and graduate students for their outstanding research accomplishments in basic and applied sciences and in arts & humanities. Befitting honors were also accorded to the recipients of US registered patents, as well as the winners of the best posters in the recently held humanities and scientific posters events, with the ceremonial spotlight being on the creative pulse of institutional scientific developments, a mission which is ardently being pursued across faculties, and advocated as part of the institutional developmental strategy. It is largely within the framework of these aspirations that the event, held under the distinguished Presence and Patronage of Kuwait University President, Prof. Abdullatif Al-Bader, and hosted by the Vice President for Research, Prof. Hasan Al-Sanad, amid the participation of his assis-

stants, Prof. Nejib Smaoui, and Prof. Obaid Al-Otaibi, as well as Prof. Ibrahim AbuEllail, Legal Advisor, and Dr. Promila Sharma, Director, Technical Information & Publications, on May 22, 2013, attained added significance with the elite presence of Vice Presidents, Deans and Vice Deans, as well



▲ Recipients of Distinguished Researcher Award

Recipients of US Registered Patents, winners of Scientific Posters, Distinguished and Best Young Researchers honored

beyond their respective scientific attainments in bringing prestige and laurels to Kuwait University's international scientific profile. "While it is immensely satisfying to see the beneficiaries of distinguished research, reflecting the growing tide of quality and excellence in faculty research, it is equally imperative to amplify and nurture the budding islands of creative excellence into a sweeping culture, spreading across their caliber, track record, and expertise, establishing KU's image and identity on the global expanse," a vision that KU is aspiring for, and a mission that solely rests on our researchers, graduates and scholars, whose efforts, experience, practice, knowledge, and collective energies could effectively elevate KU's ranking and international standing.

as awardees in various awards categories.

Speaking on the occasion, Prof. Al-Bader, welcomed the distinguished gathering, and appreciated the outstanding accomplishments of researchers, which went be-

Echoing similar thoughts, Prof. Hasan reaffirmed RS commitment towards mobilizing its resources in uplifting the quality of research at

(Contd. P.25...▶)



▲ A view of Award winning researchers

► **RS organises Multi- Awards ceremony ... (From P.24)**

KU through its support system, facilities, programs, priorities and incentives, and encouraging faculties to publish their research in international journals of impact. Thrust would also be on developing KU's areas of strengths, infrastructural assets, and a conducive climate that

spurs innovation and creativity, advanced signals of which are increasingly becoming evident, in a steadily growing volume of KU published research appearing in top ranking journals of impact. Appropriate measures are also being taken towards amplifying the quality trend

in faculty research, and motivating faculties towards high quality, high value research, that is distinguished and internationally credible. With these words, the winners in various categories were announced, applauded, awarded and honored. Listed below are the award recipients:

## Researcher Awards winners

### A. Distinguished Researcher Awards

#### Basic & Applied Sciences

- Prof. Abu Salem Mustafa -- Dept. of Microbiology, Faculty of Medicine
- Prof. Samir Fahmy Mahmoud Abdel-Hadi--Dept. of Electrical Engineering, Faculty of Engineering & Petroleum

### B. Best Young Researcher Awards

#### Basic & Applied Sciences

- Dr. Waleed Al-Herz -- Dept. of Pediatrics, Faculty of Medicine

#### Arts & Humanities

- Dr. Ali Rashed Al-Mutairi -- Dept. of Accounting, Faculty of Business Administration

### Graduate Students Project Prize

#### a) Ph.D. Degree

- Dr. Ahmad Hashim Tahl -- Dept. of Chemistry, Faculty of Science

#### b) Master's Degree

- Ahmed Meslam Mohammed -- Dept. of Chemistry, Faculty of Science
- Faten Ali Al-Wathiqi -- Dept. of Microbiology, Faculty of Medicine

### Scientific Posters Award Winners

#### I. Humanities Posters Winners

##### Category I: Faculty Members

1. Dr. Amar Hasan Safar, Dept. of Curriculum & Teaching Methods, Faculty of Education  
Title of research: "The students perspective of online training @ Kuwait University"
2. Dr. Naif Al-Shemmari, Dept. of Economics, Faculty of Business Administration **(Contd. P.26...►)**

## ► Researcher Awards Winners...(From.... P25)

Title of research: *"Foreign Direct Investment in Developing Asia According to Location Advantage Hypothesis."*

3. Dr. Naif Al-Shemmari, Dept. of Economics, Faculty of Business Administration

Title of research: *"GCC Trade Potentials with EU Members."*

### Category II: Teaching Assistants

1. Dr. Mohammed Al-Fuzaie, Dept. of Jurisprudence & Rules, Faculty of Sharia & Islamic Studies

Title of research: *"Legitimate censorship over cooperative insurance companies, the strengths and weaknesses."*

2. Mr. Mohsin Al-Mualim, Dept. of Philosophy, Faculty of Arts

Title of research: *"The logical nature of pilgrims."*

### Category III: Graduate Students

1. Asma Abdullah Al-Otaibi, Dept. of Educational Management & Planning, Faculty of Education

Title of research: *"Perceptions of Educational Leaders at the Ministry of Education in Kuwait about Applying Education Professionalization Standard."*

2. Hessa Abdulaziz Al-Furaih, Faculty of Law

Title of research: *"The English judiciary's way in interpreting the applicable law clause in the Islamic Funding Contracts."*

### Category I: Faculty Members

1. Dr. Tareq Alrefai, Dept. of Physics, Faculty of Science

Title of research: *"Long-Lived Gamma Emitters in Incense"*

2. Dr. Khalid Al-Fadhlah, Abdullah Almazrouee, Saleh Alhajeri & Terence G. Langdon, Dept. of Mechanical Engineering, Faculty of Engineering & Petroleum

Title of research: *"Evolution of Microstructure and microhardness in pure copper after processing by high pressure torsion"*

3. Dr. Saad Makhseed, Dept. of Chemistry, Faculty of Science

Title of research: *"Water Soluble phthalocyanine in non-aggregated form to enhance photodynamic cancer treatment"*

### Category II: Teaching Assistants

1. Dr. Hicham H. Dib, Dept. of Chemistry, Faculty of Science

Title of research: *"Enantio and Regioselective Biocatalytic Transesterification of Carbonate-Ester Bifunctional Compounds"*

### Category III: Graduate Students

1. Lulwa Al-Dahash & Dr. Huda Mahmoud, Dept. of Biological Sciences, Faculty of Science

Title of research: *"The role of oil degraders in survival of corals in oil contaminated environments"*

(Contd. P.27... ►)

## ▶ Researcher Awards Winners...(From.... P26)

2. Khaled Al-Qenae & Dr. Eissa Al-Safran, Dept. of Petroleum Engineering, Faculty of Engineering & Petroleum  
Title of research: "*Investigation of Heavy Oil Two-Phase Flow Pattern Transition in Horizontal and Slightly Inclined Pipelines*"
3. Fatemah W. Al-Fassan & Dr. Dunia H. Al-Gharabally, Dept. of Biological Sciences, Faculty of Science  
Title of research: "*Marine Microbial Colonization & Degradation of Wood in Kuwait*"

## Recipients of US Registered Patents

1. Prof. Charles Ezeamuzie & Dr. Ivan Edafiogho, Faculty of Pharmacy  
Patent awarded for following invention "*Enhydrazone esters for treating asthma, allergy and inflammation*" (Patent No.: US 8,324,422 B2 dated December 4, 2012)
2. Dr. Tareq Abduljahl Abahri, Chemical Engineering Department, Faculty of Engineering & Petroleum  
Patent awarded for following invention "*Apparatus and method for measuring the properties of petroleum fractions and pure hydrocarbon liquids by light refraction*" (Patent No.: US 8,332,162 B2 dated December 11, 2012)
3. Dr. Magdy S. Montasser, Dept. of Biological Sciences, Faculty of Science  
Patent awarded for following invention "*Biological control Agent for Plants*" (Patent No.: US 8,138,390 B2 dated March 20, 2012)
4. Dr. Ali Ashour Al-Jafar, Dept. of Curriculum & Teaching Methods, Faculty of Education  
Patent awarded for following invention "*Timepiece with multiplication Table Display and Method of Teaching Multiplication Tables*" (Patent No.: US 8,238,200 B2 dated August 7, 2012)
5. Dr. Fatma M. Al-Saeedi, Nuclear Medicine Department, Faculty of Medicine  
Patent awarded for following invention "*Method of treating Type 1 diabetes*" (Patent No.: US 8,314,080 B2 dated November 20, 2012)
6. Dr. Osama Abdulrahman Al-Naseem, Dept. of Electrical Engineering, faculty of Engineering & Petroleum  
Patent awarded for following invention "*Cam Controlled Electromechanical Rotary Power Inverter*" (Patent No.: US 8,437,159 B2 dated May 7, 2013)
7. Eng. Sara Abdulrahman Al-Hadhoud, Eng. Reem Al-Oufan, Eng. Hessa Saeed Al-Ajeel, Eng. Mona Ahmed & Eng. Rehab Al-Naki, Mechanical Engineering Department, Faculty of Engineering & Petroleum  
Patent awarded for following invention "*Flipping trash can*" (Patent No.: US 8,157,159 B2 dated April 17, 2012)
8. Eng. Hanan Al-Awadhi, Eng. Mohammed Al-Essa, Eng. Ahmed Al- Jama'an & Eng. Abdulwahab Al-Qabandi, Mechanical Engineering Dept., Faculty of Engineering & Petroleum  
Patent awarded for following invention "*Can Crusher*" (Patent No.: US 8,307,763 B2 dated November 13, 2012)

RS extends the benefit of English Language Editing Service to facilitate KU researchers

New service aimed at improving the quality of manuscripts for publication in high ranking journals of impact

In its continuous efforts towards improving and enhancing its services-sphere, the Research Sector recently announced the privilege of an *English Language Editing Service* to benefit the faculty research community in improving the quality of their research papers, for publication in top-ranking international refereed journals of impact. The purpose is to improve the standard of English manuscripts, ensuring linguistic clarity, precision and consistency, the core elements for high quality, scientifically compelling research papers.

RS consistent efforts in this direction were driven by the need for faculties to have the advantage of generating high quality manuscripts, for submission to ranked international journals, leading to instituting this service, in coordination with the Nature Publishing Group (NPG), subsequently announced in October 2013. The key features of NPG Language Editing Service include:

- High-quality editing by native English-speaking editors.
- Editors with a relevant scientific, technical

or medical background, matching the researchers area of research.

- A further quality assessment of each edited paper by an experienced senior editor.
- Rapid turnaround and reliable delivery.
- Feedback to help researchers develop their writing skills.

On its part, the Research Sector would cover the cost of language editing services for following submissions:

1. Manuscripts where the sole, or corresponding author, is an Assistant Professor at KU.
2. Manuscripts acknowledging Research Initiation Grant (RIG) projects.
3. Manuscripts acknowledging Priority Research projects.

The service also entitles researchers to pay for the Language Editing Service from the running cost of their ongoing research projects.



For those entitled to free language editing, or have sufficient budget to cover the cost of this service in their ongoing research project, may submit their request to the Research Sector using the following link:

[http://www.rsonline.ku.edu.kw/RSNews/Eng\\_Editing.aspx](http://www.rsonline.ku.edu.kw/RSNews/Eng_Editing.aspx)

Researchers, willing to pay for the service, may directly submit their manuscripts to NPG Language Editing website <https://languageediting.nature.com/>, and receive a 15% referral discount on submission. The following document provides instructions for direct submission of manuscripts:

[http://www.rsonline.ku.edu.kw/RSNews/UploadFiles/upload\\_manuscript.pdf](http://www.rsonline.ku.edu.kw/RSNews/UploadFiles/upload_manuscript.pdf)

► **RS Publications released...(From.... P 21)**

in a sample of Kuwait University Students," a study that discusses various political and social issues related to national identity, and samples students from globalization and media influence, as well as post modernism.

C. **Series of Conference & Symposia Proceedings:** The series documents CGAPS seminars and conferences.

D. **Volumes of Selected Documents of the Gulf & Arabian Peninsula Region and its Vicinity:** The volume aggregates

important documents issued by formal bodies in the Gulf Region, and highlights the region's current political, economic, social and cultural events.

E. **M.A. and Ph.D. Dissertation Abstracts:** The document presents abstracts of Master's and Ph.D. dissertations.

F. **Guide to M.A. and Ph.D. Dissertations in the Gulf and Arabian Peninsula Region:** This guide outlines essential information on M.A. and Ph.D. dissertations and authors, with a focus on Gulf

and Arabian Peninsula region, authored by either Kuwait University staff members or of GCC universities. The guide is intended to assist researchers interested in the region, and is released in two volume, documenting M.A. and Ph.D. Dissertations.

Overall, these documents profile a dynamic outlook of institutional development within the broad framework of KU's scientific programs and activities, providing an enduring

(Contd. P.29...►)

## ► *RS Publications released...(From.... P 28)*

platform for the relay and sustained exposure of institutional scientific vitality worldwide. The intent is to expand institutional scientific horizons, and register KU's international presence, on grounds of its scientific strengths, and impact of its published research, enlisted in international refereed journals, exhibiting competitive world standards. In this endeavor, the range and diversity of OVPR's publications, are progressively delivering critical scientific

information worldwide, keeping the publications momentum in a dynamic state of flux. Given this momentum, while the newly released documents carry forward OVPR's commitment, ensuring wide dispersal of institutional scientific information, RS production momentum has already shifted to the next consignment of upcoming publications, currently under various phases of production, in keeping with the commitments for timely release of

key documents over the coming months, overseeing organized transmission of critical information for the benefit of the divergent scientific community worldwide. Essentially, this purpose lies at the heart of the OVPR's broad strategy for keeping KU's scientific domain perpetually in the global eye, through relay and release of key publications, driving world attention on KU's expanding scientific horizons, a mission that is as enduring, as it is long-lasting. ■

## ► *e-manual released...(From.... P4)*

and scientifically sound proposals in *basic* and *applied sciences*, and in *arts* and *humanities*, for redressing scientific complexities, and finding practical solutions.

This purpose underlines the current dynamics of institutional research, with RS encouraging and driving faculties to the domain of funded research activity, through a series of stimulants and measures as rewards and incentives that profess pursuit of high quality research, through proposals that could serve the needs of society, and advance knowledge. A congenial climate is also being created through advanced infrastructural assets, placing world-class facilities at the disposal of researchers, for high quality, distinguished research of significant scientific impact.

For researchers information, the e-manual, organized by specific chapters and articles, allows instant access to any clause or relevant regulation, through simple clicking, keeping the users' community updated and informed about current regulations governing the grant awards. Meant as an essential elec-

tronic reference guide, facilitating preparation, submission and implementation of research projects, the e-manual is posted on RS website, ideally providing an authentic and reliable guide on current procedures, rules and regulations, governing the RS grant support system. In releasing the manual's third edition, RS thrust is on attracting faculties to the domain of funded research, and sustaining elevated quality standards in KU research, through the privilege of incentive rewards, driving researchers towards creative and distinguished research outputs, both from *funded* or *unfunded* research, published in top ranking journals of international repute and impact, with JCR index being the universal marker of high quality research. RS thrust would remain on this ambitious goal, setting the *benchmark for high quality research* at KU, with the manual outlining explicit requirements for attaining distinguished, and internationally credible outputs.

All inclusive, *Research Support Rules & Regulations, 2013*, is an *explicit, robust* and *reliable* users-guide, providing first-hand in-

formation on the mechanism and modalities of grant awards at KU. Intended as a handy reference, the manual aims at facilitating faculties in developing their research proposals in compliance to KU's currently valid and applicable policy and regulations, guiding researchers to wade through the critical phases of project submission, approval, implementation, reporting and publications stages, with essential information at their disposal for implementing and accomplishing their research goals. In releasing the manual's 2013 edition, it is RS ardent hope that the faculties draw maximum benefit from the available resources in achieving their research interests and objectives, through internationally credible outputs, the goal that KU is aspiring to achieve. ■



► Research Support Manual, 2013

► Analysis of thin-film silicon solar cells...(From.... P.16)

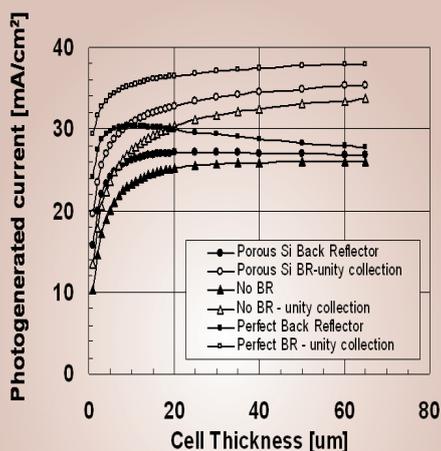


Fig. 2. Photogenerated current density as a function of the epitaxial thin-film thickness with and without back reflection. Black symbols: practical collection efficiency as in demo-cell, Open symbols: ideal unity collection efficiency.

The analysis shows that the light trapping boost in the photocurrent is limited to only 8% due to relatively high reflectance and poor light diffusing

properties of the plasma textured front surface as well as to modest back reflection properties from the porous silicon stack. In addition, it is found that the demonstration cell suffers from excessively high front surface recombination and also significant back interface recombination which lead to the observed modest cell performance. The analysis suggests that very little more is to be gained from modifying the structure of the porous silicon stack reflector from its present shape. A maximum boost of 20% in the current is predicted with a perfect reflector. However, realization of a perfect back reflector is not, at least for the time being, an easy task. Therefore, one should appreciate the 10% gain offered by the stack reflector and concentrate

on improving surface passivation, optimize front surface texturing and antireflection coating (ARC) with the goal of achieving: (1) maximum surface recombination velocities in the 1000–5000 cm/s range, (2) flat front surface reflectance of 2% or less in the medium and long wavelength range and (3) better light diffusing properties. Succeeding to reach these goals, adjusting the epi-layer thickness to 25 µm approximately and limiting the maximum front metal coverage to 5% would boost the photocurrent to 34 mA/cm<sup>2</sup> and the efficiency to 15–16%. In a recent work an efficiency of 16% and a photocurrent of 33.2 mA/cm<sup>2</sup> have been reported for a 2x2 cm<sup>2</sup> cell with many of these recommendations implemented.

► Silicon Solar Cells Technology.(From.... P.11)

of 150µm down to 40µm (1µm is equivalent to one over a million of a meter) with efficiencies higher than 20%.

The *Shagaya Renewable Energy Master Plan* proposed by KISR, is to be accomplished in three parts-- 10 MW wind energy, 10 MW PV, and 50 MW thermal, equipped with 10-hour energy storage for the plant to work after sunset. Specifics about the project are reportedly outlined by Dr. Salem Al-Hajraf, Program Manager for renewable energy at KISR. It is expected that the Shagaya project will enable Kuwait to assess performance of different renewable technologies under climatic extremes. Kuwaiti engineers would then be able to identify deficiencies or limitations of technologies, undertake feasibility analysis and develop the hands-on experience. Following the project's first phase, the second phase will oversee the expansion of plant's capacity to 1,000 MW, and to 2,000 MW in the third phase. The project's first phase is to be financed by

the government, while the second and third phases are to be offered to investors on Build-Operate-Transfer (BOT) basis over 25 years. The Shagaya plant, reportedly is a joint Ministry of Electricity and Water (MEW) and KISR venture, with the project's power output to be bought by MEW, Kuwait's sole electricity producer and distributor.

Dr. Yaser believes that high-efficiency PV is an attractive industry for Kuwait, being an energy intensive economy. To produce crystalline silicon PV modules of high efficiency, one of the widest used PV technologies, a good fraction of the costs go into the electricity needed to produce high quality silicon wafers from molten silicon. The heavily subsidized, low-cost electricity in Kuwait (<0.01 Euro/KWh) would help establish a lo-



▲ Frequency of sandstorms—a major challenge...!

cal PV industry, providing a competitive edge and leverage into the PV market.

Kuwait, in fact, recognized the significance of renewable energy in the region as early as 1984, and was the first to go the solar energy way, using BIPV panels in Kuwait English School. Presently, Kuwait's renewed interest stems from the spiraling demand for energy, with the country aiming to produce 15% of its electricity, from renewables by 2030.

## ► Postdoctoral Research...(From.... P22)

State University, basic mechanical principles and how to apply these in tests, so as to generate data and facilitate a deeper understanding of the feeding ecology of Tai primates. At the time of this report, Erin was still involved in gathering additional data from a range of primate species, and simultaneously preparing to train other researchers.

Describing the Tai National Park, Dr. Adam found it an ideal environment for the field study, offering an amazing opportunity to observe, understand and learn about primate-plant interactions within the forest. The national park is home to 47 mammalian species, including 11 primates, pygmy hippopotamus, leopards, among others. In addition, the park has over 250 species of birds, 40 species of reptiles and amphibians, and huge numbers of invertebrates. Many of this vast and varied fauna rely heavily on over 1300 species of higher plants as their vital food source, so a greater understanding of the food chain is a key part of the continuing research at the site. Whilst research has been conducted in the Tai National park

for many years, it is most famous for its chimpanzees, whose use of stone tools for breaking open the palm nuts is amazing, a behavioral pattern discovered nearly 30 years ago. More recently, the sooty mangabey, one of the monkey species, has been discovered to excel at the mechanically-difficult task of breaking open large hard nuts with its teeth, which it locates on the ground. The behavior of these monkeys has been studied by Dr. Scott McGraw for several years, generating an extensive data on the eating habits of these and other monkeys, which can now begin to be complemented by field measurements of the mechanical properties of these foods.

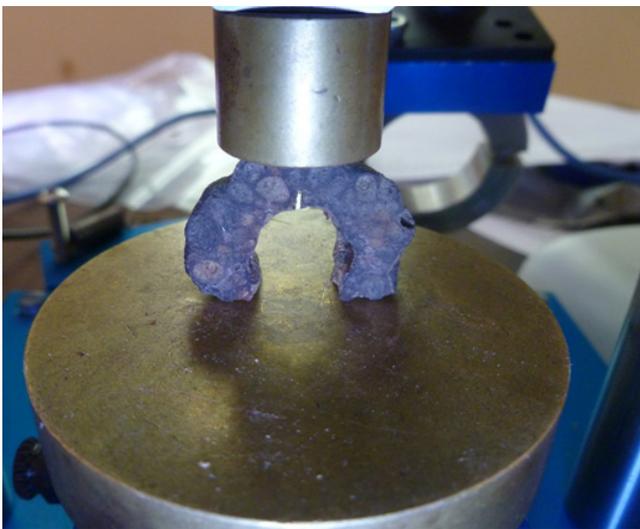
Dr. Adam's month-long research mission achieved its initial purpose of generating immensely valuable mechanical data on primate foods in the midst of the park's natural environment. This data will provide a deeper understanding of the mechanical nature of primate food sources, delivering an opportunity for transferring skills and techniques in biomechanical testing to an international team of researchers. The data gathered in this preliminary research is expected to generate significant outputs to be published in high-rank-



▲ A Sooty Mangabey Eating

ing international journals, marking the successful culmination of the study's first phase. Overall, the study's performance during this phase resulted in accomplishing 388 tests on leaves, fruits and seeds, involving 15 different species of edible plants. At this juncture, the data-gathering process is still in progress with Erin and other newly-trained personnel, which will build up the dataset further.

Presently, one of the study's main benefits concerns the mechanical profiling of fruits of *Sacoglottis gabonensis* tree, a common species that many primates rely on for subsistence, including the Sooty Mangabey that seems to virtually live on the tree's nut-like seeds. The study has opened the door for future collaborations between Kuwait University, Ohio State University and the University of Florida, raising prospects for collaborative research, specifics of which are currently being discussed. ■



▲ Testing the toughness of *Sacoglottis gabonensis* seeds

**RS perceives a climate of creative instinct dominating faculties drive towards innovative ventures that are globally acclaimed, scientifically recognized, and internationally competitive...!**

**RS records an unprecedented 6.3% growth in faculty research with 606 projects defining the spectrum of funded research across KU faculties during the academic year 2012/13**

*RS strategy aimed at placing advanced facilities at faculties disposal to trigger scientific innovation, boost creativity & encourage discovery*

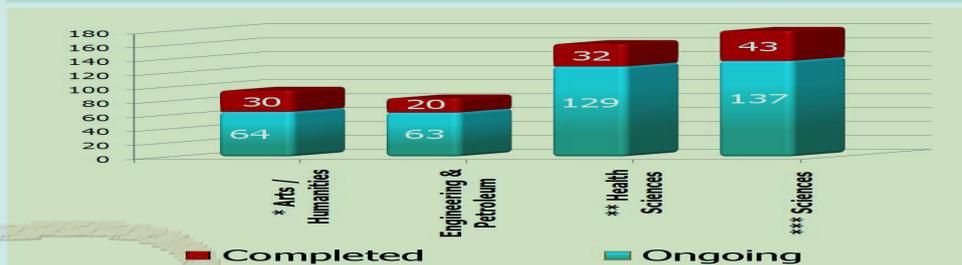
Academic year 2012/13 registered unprecedented growth in faculty research activity, crossing the 600 figure for the first time, with 606 projects defining the spectrum of funded research at Kuwait University (KU) within a span of a single academic cycle (Sept. 2012 through August 2013). Statistically, the prime indicator of growth was a clear 6.3% increase in faculty research over the 570 projects recorded during the preceding year 2011/12. While, all 13 colleges have consistently remained active participants in the Research Sector's (RS) grant process, year 2012/13 was particularly significant with RS recording the entry of the newly established college of *Computing Science & Engineering* in mainstream research with the submission of one project, currently under-process, as it looks forward to similar grants initiative from the other newly established college of *Architecture*. Year 2012/13 was also significant in redefining the parameters of grants activity with the restructured grants support system providing the basis for generating the next, more comprehensive and advanced third version of the *research support manual*, on the threshold of release in the current academic year 2013/14, with the *e-manual* further facilitating the faculty research community. Given the additional advantage of researcher-friendly *clauses and bye-laws, facilities and benefits, flexibility and opportunities*, RS anticipates resurgence of interest in funded research as a way to pursue high quality, issue-based research that addresses priorities and concerns, for legitimate and com-

**Newly established college of Computing Science & Engineering opens its research account with the submission of one proposal**

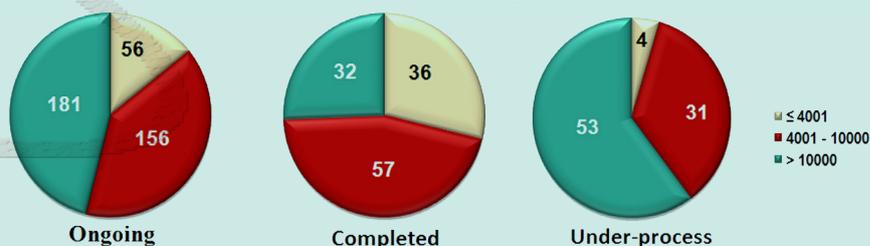
**Table 1. TOTAL RESEARCH ACTIVITY, 2012/13 (Sept 1, 2012 to Aug 31, 2013)\***

Project Status	Funding ** Levels			Total
	less than 4001	4001 - 10,000	more than 10,000	
Ongoing	56	156	181	393 (64.9%)
Completed	36	57	32	125 (20.6%)
Under-process	4	31	53	88 (14.5%)
<b>TOTAL</b>	<b>96</b> (15.8%)	<b>244</b> (40.3%)	<b>266</b> (43.9%)	<b>606</b>

\* Source KURS, Data upto February 28, 2013 (Includes ongoing/completed projects from previous year).  
\*\* Values in KD.



\* Includes the Faculties of Arts, Business Admn., Education, Law, Sharia and Social Sciences.  
\*\* Health Sciences Center Includes Faculties of Allied Health Sciences, Dentistry, Medicine and Pharmacy.  
\*\*\* Includes Faculties of Science and Women.



elling answers to unsolved issues and realities of science and society, through well-designed research proposals, sustained by the system of grant support.

RS strategy is to place advanced facilities and supportive measures at the faculties disposal to trigger *scientific innovation*,  
**(Contd. P.33.. ▶)**

► **Statistics on Faculty Research** ...(From P.32)

**A new category of Specialized Research Units & Laboratories (SRUL) incorporated within the domain of funded research, expanding existing *Types of Grant* award categories from *nine* to *ten***

boost creativity and encourage discovery. Doors would, therefore, remain open for original proposals that explore the unknown, and unravel the hidden answers, with all faculties' participation encouraged and invited in uplifting the quality of institutional research through their scientifically sound, advanced and innovative ventures.

Nurturing these aspirations, while RS looks forward to increased inflow of proposals from faculties in the year ahead, the grants system itself is scaling new levels of growth, having reached the gross figure of 606 projects, reflecting the faculties cumulative participation and performance in funded research during 2012/13. These included 393(64.9%) ongoing projects, 125 (20.6%) completed projects, and 88 (14.5%) newly submitted under-process proposals (Table 1). By funding levels, a higher concentration of 266(43.9%) projects figured in the maximum budgetary category of more than KD 10,000/-, closely followed by 244(40.3 %) projects in the medium budgetary range of KD 4001-10,000/-, while the least number of projects 96(15.8%) were enlisted in less than KD 4001/- category. Taken together, the highest and medium range projects accounted for an overwhelming 510 (84.2%) projects, re-emphasizing the faculties growing inclination towards well-defined, multidisciplinary studies that invariably need substantial resources and support for achieving comprehensive objectives, and generating distinguished outputs. Such studies are the key to merging of scientific interest across disciplines, building collaborations and sharing of expertise with industry and institutions, so that empirical studies could jointly be pursued for investigating unexplored challenges of science in search of potentially

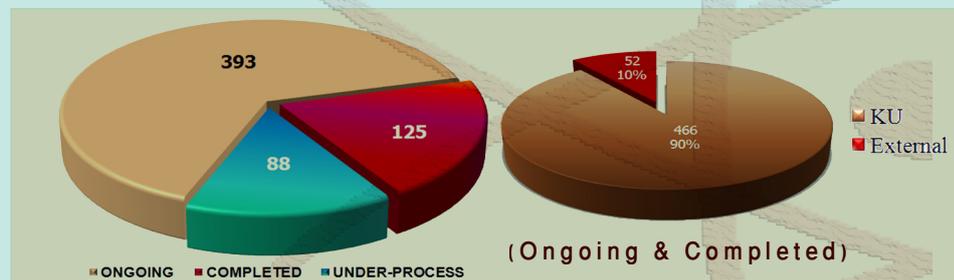
**Table 2. TOTAL ONGOING, COMPLETED & UNDER-PROCESS PROJECTS by FACULTY & FUNDING SOURCE, 2012/13 (Sept 1, 2012 to Aug 31, 2013)\***

FACULTY	ONGOING		COMPLETED		UNDER-PROCESS		TOTAL		GRAND
	KU	EXT**	KU	EXT	KU	EXT	KU	EXT	TOTAL
Allied Health Sciences	15	2	1	-	5	-	21	2	23
Arts	8	1	8	1	2	-	18	2	20
Business Admn.	10	-	6	-	1	-	17	-	17
Computing Science & Eng	-	-	-	-	1	-	1	-	1
Dentistry	14	3	6	-	3	-	23	3	26
Education	13	1	1	-	2	2	16	3	19
Engineering & Petroleum	54	9	16	4	12	3	82	16	98
Law	2	-	1	-	-	-	3	-	3
Medicine	70	10	21	-	16	3	107	13	120
Pharmacy	15	-	4	-	6	-	25	-	25
Science	104	14	30	3	19	5	153	22	175
Sharia	9	-	6	-	2	-	17	-	17
Social Sciences	18	2	6	1	2	1	26	4	30
Women	19	-	9	1	3	-	31	1	32
<b>TOTAL</b>	<b>351</b>	<b>42</b>	<b>115</b>	<b>10</b>	<b>74</b>	<b>14</b>	<b>540</b>	<b>66</b>	<b>606</b>

518

\* Source KURS, Data upto August 31, 2013.

\*\* External Institutions.



significant answers that advance knowledge and refine empirical understandings.

Given the higher concentration of projects in the upper levels of grant support for the second consecutive year (2011/12 & 2012/13), RS is cautiously looking forward to amplification of this trend in faculty research, that will eventually pave

the way for large-scale collaborative studies, in partnership with external institutions, as a desired step towards internationalization of KU research, a mission that tops RS objective and agenda ahead. Grounds are, therefore, being laid through favorable, flexible and attractive measures and moves to lure the faculties to be creative,

(Contd. P.35... ►)

► **Single Machine Scheduling with Inserted Idle Time ... (From.... P.15)**

task, and no more idle time is allowed once the processing of this task begins. Applications of the latter type of idle time insertion are, e.g., in process industries where production processes may be shut down only after all tasks are completed, and in production systems involving the use of heavy machineries whose shutting down and restarting between consecutive tasks may be very expensive and time consuming.

This paper deals with the problem of scheduling tasks for processing on a single machine (i.e., processor). The objective is to determine the optimal amount of idle time and the optimal schedule that jointly minimize the weighted sum of a quadratic function of task lateness where the idle time is inserted only before the processing of the first task begins. The single machine scheduling problem is important because of its practical aspects in considering integrated processes as single machine systems, and its usefulness in providing valuable insights into scheduling more complex systems. In fact, the solution strategies for some complex systems often require solving single machine sub-problems. To accomplish the proposed objective, we first prove that the solution method proposed by Sen et al. (1995) for the problem does not work

because their ordering rule for adjacent tasks is not applicable to non-adjacent tasks [Sen, T., Dileepan, P. and Lind, M.R. (1995) 'Minimizing a weighted quadratic function of task lateness in the single machine system', International Journal of Production Economics, Vol. 42, No. 3, pp. 237–243]. Sen et al. incorrectly assert that if a task immediately precedes another task, the first task always precedes the second task even if the two tasks are not adjacent. This causes their method to discard many (partial) schedules resulting in an erroneous optimal schedule! We then introduce a precedence relation structure in terms of permanent and temporary relations among adjacent tasks which is used to develop a new exact two-stage algorithm for the proposed NP-hard problem. The first stage determines an initial ordering of tasks, investigates its optimality, and when optimality cannot be established, it considers the ordering as an incumbent solution. The second stage is a branch and bound which utilizes some improved lower bounds as well as the lateness cost of incumbent as an initial upper bound to fathom (partial) schedules. It avoids investigating dominated branches by using a number of effective branching rules; thus, greatly reducing the size of the branching tree.

Our extensive computational experi-

ments demonstrate that the proposed algorithm can solve large instances of this difficult problem quickly on a PC. The results also indicate that very high percentages of incumbents are in fact optimal sequences. It is shown that the incumbent's upper bound, the improved lower bounds, and the branching rules have very drastic effects on fathoming (partial) sequences and thus reducing CPU time. In addition, the results reveal that the tardiness factor, due date range factor, and lateness penalties affect problem difficulty.

The problem studied here is general in the sense that its special cases reduce to some classical single machine models. In particular, the proposed algorithm is applied to three of these cases namely the problems of minimizing a quadratic function of task lateness, a quadratic function of completion times, and the mean squared deviation of completion times about a common due date. The reported CPU times show that our algorithm drastically outperforms the existing algorithms.

Finally, the proposed adjacent precedence relation structure can be extended to develop solution methods for some other scheduling problems. Investigation is currently under way to identify and solve such problems.

**OVPR introduces and activates Instagram application to serve researchers**

The Office of the Vice President for Research (OVPR) announces the introduction and activation of Instagram application, in keeping with latest developments in the sphere of technology, offering electronic interface to researchers. The objective is to keep the faculty research community updated and informed about the ever expanding sphere of institutional research activity, events and happenings organized by the Research Sector (RS), and the facilities available for advanced and innovative research. The key objective is to encourage researchers' participation in scientific

development and research activity. The Research Sector also takes the opportunity of informing the researchers that the RS staff is always ready to respond to their queries, and would welcome suggestions for developing scientific research at Kuwait University, while encouraging them to keep pace with RS latest developments, news and events.

For information/queries contact:  
 Tel: 24835258, 24985205  
 Fax: 24838336  
 Website: <http://www.ovpr.kuniv.edu>  
 Twitter: kuResearch



Instagram: kuresearch  
 For accessing Research Development Dept:  
 Twitter: research-DD  
 Instagram: researchdd

### ► Statistics on Faculty Research ... (From P.33)

putting their scientific caliber and potential in the global spotlight. The new version of the grant support system is actually aimed at facilitating faculties to benefit from supportive measures, *improve, collaborate* and *enhance* their research performance, and gain the quality mileage in elevating their research record. On its part, RS would closely be monitoring the effectiveness and impact of new regulations in changing the dynamics of faculty research at KU, and in spearheading the faculties interest and appetite for joint, relevant and issue-based studies.

Going by the projects status, a reassuring direction is apparent in the sheer number of projects figuring under the highest budgetary category of more than KD 10,000/-, within each

*status-group*, with 181(46.1%) *on-going* and 53 (60.5%) *under-process* projects having budgets exceeding KD 10,000/-, while maximum completed 57 (45.6%) projects were in the medium budgetary category. This shows the faculties gradual shift away from *small-budgeted, limited-objectives* and *shorter-duration* projects in favor of comprehensive, well-defined studies that invariably require bigger resources and multi-expertise for research that is strategic and solution-based, with statistics clearly demonstrating this shift (Table 1).

On the *research performance front*, total *ongoing* and *completed* projects provided a valid measure of the faculties' cumulative performance during 2012/13, which reached a record total

of 518 projects. Faculty-wise performance showed Sciences faculties (*Science + Women*) collective performance superseding other faculties with a total of 181 (34.8%) ongoing & completed projects, closely followed by the Health Sciences Center faculties (*Medicine, Dentistry, Pharmacy & Allied Health Sciences*) with 161(31.1%) ongoing & completed projects, Arts & Humanities faculties (*Arts, Business Administration, Education, Law, Sharia & Social Sciences*) combined performance accounting for 94 (18.1%) ongoing & completed projects, and Engineering & Petroleum faculty's performance recording 83 (16%) ongoing & completed projects (Table 2).

In addition, 88 under-process projects further reflected faculties newly submitted proposals for grant support, which had entered the review phase. This year the newly established faculty of *Computing Science & Engineering* opened its research account with the submission of one project, which was in the processing phase, and in analyzing the comparative input of faculties' newly submitted projects, this faculty's record has been merged with the Engineering & Petroleum faculty in view of the engineering element and focus of research. Of the total (88) under-process projects, maximum projects 33(37.5%) were submitted by the Health Sciences faculties, followed by 27 (30.7%) projects by Sciences colleges, while Engineering & Petroleum faculties (Engineering & Petroleum + Computing Science & Engineering) were responsible for 16 (18.2%) new proposals, and Arts & Humanities newly submitted proposals totaled 12 (13.6%). An exclusive analysis of 393 ongoing projects, further showed science faculties to be the largest recipients of grants with 137 (34.9%) *ongoing* projects, followed by Health Sciences faculties with 129 (32.8%) projects, Arts & Humanities pursuing

**Table 3. PROJECT STATUS by FACULTY & FUNDING\*\* LEVELS, 2012/13 (Sept 1, 2012 to Aug 31, 2013)\***

FACULTY	ONGOING			COMPLETED			UNDER-PROCESS			TOTAL
	less than 4001	4001-10,000	more than 10,000	less than 4001	4001-10,000	more than 10,000	less than 4001	4001-10,000	more than 10,000	
Allied Health Sciences	9	2	6	1	-	-	2	2	1	23
Arts	1	8	-	2	6	1	-	2	-	20
Business Admn.	2	8	-	3	3	-	-	1	-	17
Computing Science & Eng	-	-	-	-	-	-	-	1	-	1
Dentistry	4	7	6	-	5	1	-	3	-	26
Education	3	9	2	1	-	-	-	2	2	19
Engineering & Petroleum	4	21	38	3	10	7	-	1	14	98
Law	1	1	-	-	1	-	-	-	-	3
Medicine	11	29	40	6	11	4	-	5	14	120
Pharmacy	5	1	9	2	1	1	-	4	2	25
Science	4	39	75	8	8	17	1	6	17	175
Sharia	2	7	-	5	1	-	-	2	-	17
Social Sciences	3	15	2	2	5	-	1	1	1	30
Women	7	9	3	3	6	1	-	1	2	32
<b>TOTAL</b>	<b>56</b>	<b>156</b>	<b>181</b>	<b>36</b>	<b>57</b>	<b>32</b>	<b>4</b>	<b>31</b>	<b>53</b>	<b>606</b>

\* Source KURS, Data upto August 31, 2013.  
\*\* Values in KD.



(Contd. P.36...)

► Statistics on Faculty Research...(From P.35)

64(16.3%) projects, and Engineering & Petroleum faculty receiving 63 (16%) grants (Table 2).

Distribution of *ongoing projects* (393) by funding-levels, showed a higher concentration of 181(46.1%) ongoing projects in the more than KD 10,000/- category, 156 (39.7%) projects in the medium-range budgetary category of KD 4001-10,000/-, and 56(14.2%) projects in the lowest budgetary level of less than KD 4001/- (Table 3). A somewhat different pattern, however, emerged in terms of 125 completed projects, with maximum 57(45.6%) completed projects in the medium range budgetary category of KD 4001 – 10,000/-, followed by 36(28.8%) completed projects in the less than KD 4,001/- budgetary category, while lowest completed projects 32(25.6%) were observed in the highest budgetary category of more than KD 10,000/-.

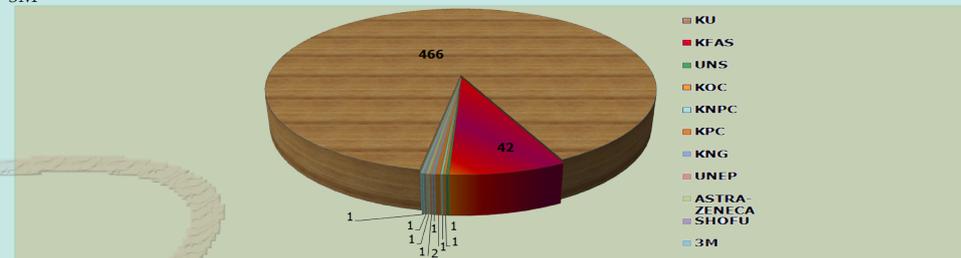
The distribution of completed projects by faculties showed higher completion rate achieved by Sciences faculties (43, 34.4%), with almost equitable performance levels attained by Health Sciences (32, 25.6%) and Arts & Humanities (30, 24%) colleges, and Engineering & Petroleum faculty registering a relatively lower number (20,16%) of completed projects (Table 3).

Year 2012/13 also recorded a spurt in the domain of collaborative research, with as many as 10 *external institutions* actively participating in the sustenance of faculty research, alongside Kuwait University. Taking 518 ongoing and completed projects, Kuwait University was the dominant grant provider in supporting an overwhelming 466 (90%) ongoing and completed projects, while an additional 52 (10%) projects were sustained in partnership with 10 *external institutions*, involved in scientific collaboration with KU. These collabo-

**Table 4. TOTAL ONGOING & COMPLETED RESEARCH PROJECTS by FUNDING SOURCE, 2012/13 (Sept 1, 2012 to Aug 31, 2013)\***

FACULTY	KU	KFAS	UNS	KOC	KNPC	KPC	KNG	UNEP	ASTRA-ZENECA	SHOFU	3M	TOTAL
Allied Health Sciences	16	2	-	-	-	-	-	-	-	-	-	18
Arts	16	2	-	-	-	-	-	-	-	-	-	18
Business Admn.	16	-	-	-	-	-	-	-	-	-	-	16
Dentistry	20	1	-	-	-	-	-	-	-	1	1	23
Education	14	1	-	-	-	-	-	-	-	-	-	15
Engineering & Petroleum	70	8	-	-	1	2	1	1	-	-	-	83
Law	3	-	-	-	-	-	-	-	-	-	-	3
Medicine	91	9	-	1	-	-	-	-	1	-	-	101
Pharmacy	19	-	-	-	-	-	-	-	-	-	-	19
Science	134	16	-	-	-	-	-	-	-	-	-	151
Sharia	15	-	-	-	-	-	-	-	-	-	-	15
Social Sciences	24	3	-	-	-	-	-	-	-	-	-	27
Women	28	-	1	-	-	-	-	-	-	-	-	29
<b>TOTAL</b>	<b>466</b>	<b>42</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>518</b>

\* Source KURA, Data upto August 31, 2012 (Include ongoing/completed projects from previous year).  
 KU Kuwait University  
 UNS UNESCO  
 KNPC Kuwait Nation Petroleum Corporation  
 KNG Kuwait National Guards  
 ASTRAZENECA  
 3M  
 KFAS Kuwait Foundation for the Advancement of Sciences  
 KOC Kuwait Oil Company  
 KPC Kuwait Petroleum Corporation  
 UNEP United Nations Environmental Program  
 SHOFU Co.



rators included *Kuwait Foundation for the Advancement of Sciences* (KFAS) responsible for funding 42 (80.1%) projects, *Kuwait Petroleum Corporation* (KPC) supporting 2 (3.8%) projects, and the remaining external support was distributed over 1 (1.9%) project each supported by the remaining eight sponsors – UNESCO, *Kuwait Oil Company* (KOC), *Kuwait National Petroleum Company* (KNPC), *Kuwait National Guards* (KNG), *United Nations Environmental Program* (UNEP), *AstraZeneca*, *Shofu Company*, and *3M* (Table 4). As regards 88 *under-process projects*, 74(84%) newly submitted proposals were lined-up for KU's grant support, and remaining 14(16%) pro-

jects were undergoing the review process for external support (Table 2).

Coming to new developments, RS incorporated a new grants category in the realm of funded activity, with the inclusion of *Specialized Research Units & Laboratories* (SRUL), expanding the domain of funded research beyond the existing *nine*, to *ten research support categories*. This category has already been activated with the grant of two projects, one each for the faculties of Medicine and Science, awarded recently under the newly established SRUL category, and appropriately included in Table 5, presenting the current outlook of total faculty research activity by Types

(Contd.P.38... ►)

*Need for establishing disaster preparedness fund as a long term vision for meeting climatic exigencies*

**RS hosts an enlightening seminar on  
"Risks of extreme sea-level and weather conditions due to a changing climate"**

In an enlightening presentation, Prof. Bilal M. Ayyub, Professor of Civil & Environmental Engineering, University of Maryland, College Park, and Director, Center for Technology & Systems Management, USA, drew attention to the devastating and life-threatening scenarios caused by such natural calamities as floods, hurricanes, and earthquakes on human life, infrastructure, facilities and services, attributable to climatic changes and extreme weather conditions. Speaking at the seminar on, "Risks of extreme sea-level and weather conditions due to a changing climate," hosted by the Vice President for Research, Prof. Hasan Al-Sanad, on Tuesday, May 14, 2013, Prof. Ayyub referred to the implications of global climatic trends, resulting in sea level rise, and extreme weather conditions, holding propensity of wreaking havoc on communities, infrastructures, power and communications systems, through flooding, inundations, loss of life, failure of power and services, invariably costing billions of dollars for the systems to recover, restore, and assume functionality. Exhibiting the impact of hurricane Sandy that struck US in 2012, through visuals of paralyzed life, flattened structures, inundated coastal areas and nuclear power shutdowns, Prof. Ayyub said that such scenarios provoke critical thinking on existing planning, engineering and management practices, as regards infrastructural resilience to withstand, and recover such extreme natural climatic events.

Providing an analytical outlook of diverse scenarios, and using available data for probability models, he explained the need for risk assessment, and cost-effective strategies by involving a carefully selected and intellectually diverse community of experts for decisive

*Direr need for critical thinking on existing practices for infrastructural resilience to withstand, and recover*



Participants at the seminar

measures that could boost structural resilience, human life, minimize risks and ensure long-term benefits. Since, uncertainties surround the potential risks of calamities due to extreme weather conditions, and sea-level rise, our answer lies in being in a state of preparedness through risk



Prof. Ayyub presenting Sea-level and Weather Conditions

assessment. Pointing out the extreme weather conditions in the Gulf area, he mentioned urban heat and poor air quality, being the conditions rife with risks and uncertainties, and called for measures that could enhance resilience, risk avoidance, and as definitive steps towards long-term safeguards. As for addressing uncertainties, he expressed the need for developing predictive models through quantitative assessment of the risks entailed, though such an exercise would require developing spatial risk profiles, based on hazard-likelihood assessment, scenario-identification, consequence and event's criticality, using inventories of assets for vulnerability assessment, and benefit-cost analysis for risk-management, and resilience.

Though, Prof. Ayyub's talks largely centered on his exhaustive study, and understanding of such scenarios in US, he believed that the methodology is deployable in risk assessment studies elsewhere, in other regions, and

**(Contd.P.39... ▶)**

► Statistics on Faculty Research...(From P.36)

of Grants. Numerically, of the total 393 ongoing projects, distributed over Types of Grants, maximum 235(59.8%) projects were listed under the *University grants category*, and remaining spread over the categories of *External research projects* 41 (10.4%), *Graduate Research projects* 39(9.9%), *RIG projects* 33(8.4%), *Priority Research projects* 20(5.1%), *General Facility projects* 19(4.8%), *University Service Projects* 3(0.8%), newly started *SRUL projects* 2(0.5%), and *National Research project* 1(0.3%), there being no *GCC projects* during 2012/13. These figures are indicative of the dispersal of grants practically under all grant categories, with the exception of *GCC*, in the sustenance of faculty research activity, with huge preference being the *University Research Grants*, forming the core of *institutional research vis-à-vis* other types of grants. Statistics on 125 completed projects also exhibited more or less a similar pattern, with *university grants* enlisting maximum projects attaining completion status with 86(68.8%) completed projects during 2012/13, followed by completion of 15 (12%) *Graduate Research grants*, 12 (9.6%) *RIG grants* and 10 (8%) *External grants*, and 2(1.6%) *Priority research projects*. In the sphere of 88 under-process projects, 51(58%) proposals were listed under the *University grants category*, 14 (15.9%) were *External Research projects*, 11 (12.5%) *Priority Research projects*, 6(6.8%) *Graduate Research projects*, 5 (5.7%) *General Facility projects*, and 1(1.1%) *National Research project*. Overall, these figures show that the faculties were seeking new grants under major grant categories, with maximum under-review projects being the *University Grants* (Table 5).

Considering that the grants activity becomes meaningful, if it logically culminates in *productive output* in the form of published papers, generated from suc-

cessfully completed projects, finding legitimate placement in ranked journals of international repute, with impact factor rated as per the *Journal Citation Report (JCR)*, *grants, output and productivity* accord real meaning to any successfully completed project that leads to productive output. *Productivity* is thus the *quality indicator* in mapping the project's overall performance, and in determining the quality of research at KU. RS, being the staunch advocator of the *policy of high quality research*, is rigorously monitoring the faculties research outputs, and their ranking status, engaging faculties in high quality ventures that could lead to internationally credible outputs. And quality dimension is indeed improving in KU research,

which is a reassuring development, and a befitting attribute to RS current moves and measures to promote the culture of quality in institutional research, as the way to uplift institutional world ranking and status. In comparative terms, Table 6 enlists faculty-wise *research productivity* over the last five years, focusing entirely on published papers during the calendar years 2009, 2010, 2011, 2012,

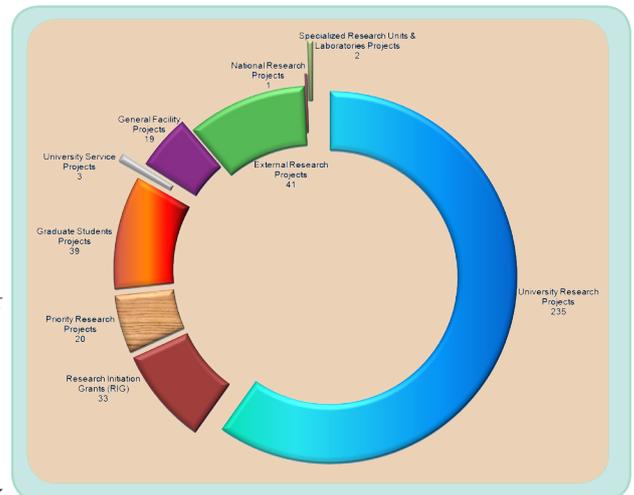
Table5. ONGOING RESEARCH PROJECTS by TYPES OF GRANTS, 2012/13 (Sept 1, 2012 to Aug 31, 2013) \*

Faculty	Types of Grants									Grand Total
	URP	RIG	PRP	GRP	USP	GFP	ERP	NRP	SRUL	
Allied Health Sciences	9	5	1	-	-	-	2	-	-	17
Arts	8	-	-	-	-	-	1	-	-	9
Business Admn.	8	2	-	-	-	-	-	-	-	10
Dentistry	12	-	-	-	-	2	3	-	-	17
Education	10	1	1	-	-	1	1	-	-	14
Engineering & Petroleum	42	4	5	-	1	3	8	-	-	63
Law	-	1	1	-	-	-	-	-	-	2
Medicine	36	9	-	23	-	-	10	1	1	80
Pharmacy	8	5	1	1	-	-	-	-	-	15
Science	70	-	3	15	2	13	14	-	1	118
Sharia	9	-	-	-	-	-	-	-	-	9
Social Sciences	16	-	2	-	-	-	2	-	-	19
Women	7	6	6	-	-	-	-	-	-	19
<b>TOTAL</b>	<b>235</b>	<b>33</b>	<b>20</b>	<b>39</b>	<b>3</b>	<b>19</b>	<b>41</b>	<b>1</b>	<b>2</b>	<b>393</b>

\* Data upto August 31, 2013.

URP = University Research Projects  
 RIG = Research Initiation Grants  
 PRP = Priority Research Projects  
 GRP = Graduate Research Projects  
 SRUL= Specialized Research Units & Laboratories Projects

USP = University Service Projects  
 GFP = General Facilities Projects  
 ERP = External Research Projects  
 NRP= National Research Projects



(Contd.P.40... ►)

SPSS Workshop scheduled for Nov. 26-27, 2013

**RS announces a 2-day Workshop on “Scientific Research & Statistical Analysis (SPSS)” for new faculty members and graduate students of Humanities & Social Sciences faculties**

Venue changed to (Lt.) Dr. Abdullatif Al-Awadhi Hall, Faculty of Education, Keifan

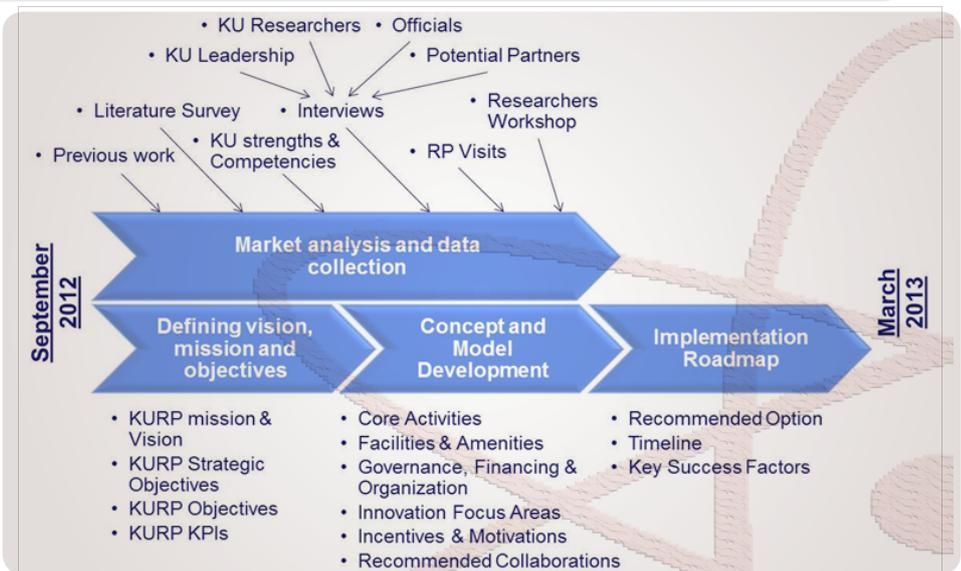
Under the Patronage of Kuwait University President, the Research Sector (RS) announces the organization of a Workshop entitled, “Methods of Writing Scientific Research and Statistical Analysis (SPSS)” for new Faculty Members and Graduate Students of Humanities and Social Sciences faculties. The workshop’s

key speakers include Dr. Othman Al-Khidir and Dr. Abdul Mohsin Al-Qahtani. The two-day event is scheduled to be held on Tuesday and Wednesday, November 26-27, 2013, at the (Lt.) Dr. Abdullatif Al-Awadhi Hall, Faculty of Education, Keifan campus, Kuwait University, from 8 am. to 1 pm.



**► RS starts KURP’s implementation... (From P.23)**

for investing research outputs and IPs, creating job opportunities, and raising capital that could boost economy. External alliances are simultaneously being enhanced in a bid to incorporate global outlook and dimensions in KU research and development, and research quality index is being improved through high impact, high value research of international credibility. It is with this outstanding vision, KURP’s concept is being transformed into empirical reality, a mission driven towards creating a dynamic climate and culture for scientific innovation and high quality research at KU, as a committed move towards



elevating KU’s international profile and status among world renowned institutions, reputable for their scientific caliber and competence.

**► Risk of extreme level... (From.... P37)**

concluded his talks by suggesting the need for disaster preparedness fund as a long-term vision to meet such environmental exigencies.

The seminar, opened on behalf of the Vice President, by Prof. Haitham

Lababidi, Asst. Vice President for Research, who welcomed the visiting expert, and thanked him for his insightful lecture on an area of strategic interest to RS. The seminar, held at the Administration Building (119), Khaldiya Campus,

Kuwait University, attracted a cross section of KU executives, faculty, researchers, administrators and students, interested in the gross realities of weather and sea-levels risks in a changing climate, and ended in a question-answer round

► Statistics on Faculty Research ...(From P.38)

and 2013. Statistically, the faculties cumulative productivity totaled 146 published papers during 2009, 143 during 2010, 141 during 2011, 103 during 2012, and 46 published papers up to the current reporting year 2013, for which the figures are tentative, and slated for upward mobility, with the year's progression. In fact, upward increase in publications is expected for the two calendar years 2012 and 2013, considering the volume of accepted papers awaiting the release of concerned journals, with 38 accepted papers for 2012 currently awaiting the release of respective journals issues, and 20 accepted papers for 2013 similarly awaiting the journals release, dependent as they are on the usual time lag between a papers acceptance and its eventual appearance in print-form, giving a definitive boost to faculties productivity levels during the years 2012 and 2013 (Table 6). In fact, research productivity levels remain in a state of perpetual change,

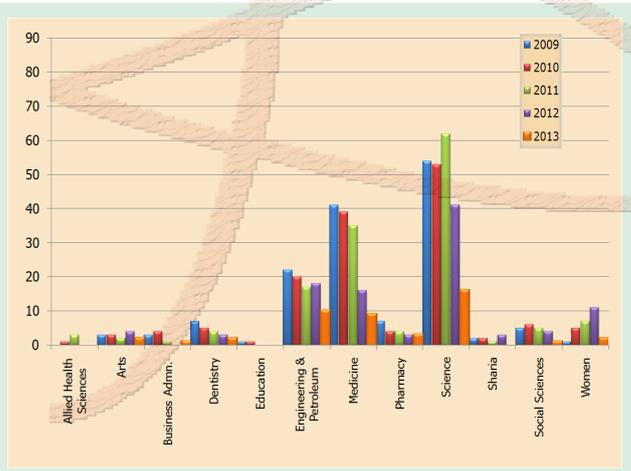
recording variations over periods and times, in view of papers *submission, modification, acceptance* and *eventual inclusion as printed journal articles*. Hence, faculties performance levels remain subject to minor productivity adjustments, yet are a strong indicator of faculties research *quality, credibility* and *excellence*.

Overall, the above statistics profile the entire spectrum of faculty research activity at Kuwait University, sustained through the fundamentals of RS grant support system, with well-defined procedures and mechanism in place for awarding grants, monitoring progress, and expectations of high quality research outputs. The entire system is refined, automated, and geared to recording the progress in faculty research, with the current growth figures in funded research activity having crossed the 606 figure, demonstrating an *undeniable strength of the RS research support system* in involving faculties in innovative research, and in expanding and elevating the *growth-curve*. Indeed, the 2012/13 research statistics have superseded all previous records, at a time when RS is issuing its new *research support manual 2013*, offering new opportunities, advantages, and supportive measures for engaging faculties in meaningful and scientifically challenging research, as well as inviting new proposals for setting-up specialized research units & laboratories, that profess excellence and world-class outlook. A promising beginning in this direction has already been made with two SRUL projects granted during the year, with faculties interest in this domain, further raising expectations of many more proposals in the year ahead. For RS, the challenge, however, is to maintain and sustain the faculties drive for innovation, and their capacity for transforming ideas into meaningful research that explores hidden realities of science, yields new knowledge, makes

Table 6. PUBLISHED PAPERS, COMPARATIVE Five CALENDAR YEARS\*  
2009, 2010, 2011, 2012 & 2013

FACULTY	Calendar Years				
	2009	2010	2011	2012	2013**
Allied Health Sciences	-	1	3	-	-
Arts	3	3	2	4	2
Business Admn.	3	4	1	-	1
Dentistry	7	5	4	3	2
Education	1	1	-	-	-
Engineering & Petroleum	22	20	17	18	10
Law	-	-	-	-	-
Medicine	41	39	35	16	9
Pharmacy	7	4	4	3	3
Science	54	53	62	41	16
Sharia	2	2	1	3	-
Social Sciences	5	6	5	4	1
Women	1	5	7	11	2
<b>TOTAL</b>	<b>146</b>	<b>143</b>	<b>141</b>	<b>103</b>	<b>46</b>

\* Figures for Published papers coordinate with calendar year (Jan. 1 to Dec.31).  
\*\* Figures for 2013 Published papers tentative



significant breakthroughs, and leads to invention. With the current clauses of the grant support system *facilitating* and *favoring* researchers, RS perceives a climate of creative instinct, driving faculties to spearhead the institutional research momentum towards innovative ventures that are *globally acclaimed, scientifically recognized, and internationally competitive...*!

**RESEARCH**  
**Research**  
**Research**

OVPR Quarterly Newsletter  
October/November 2013  
Office of the  
Vice President for Research  
Research Sector  
Research Sector  
Research Sector  
Address: P.O. Box 5969,  
Safat-13060 KUWAIT  
Website: <http://www.ovpr.kuniv.edu>